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| AP STEM and English Program Evaluation—Year 10  *Further Exploration of AP Course and Exam Taking and Passing Rates* | |
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***AP STEM and English AP Program Evaluation—Year 10***

***Further Exploration of AP Course and Exam Taking and Passing Rates***

Prepared by the UMass Donahue Institute’s  
Applied Research & Program Evaluation Group

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# Executive Summary

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| Summary of Key Findings |
| We completed descriptive analyses to examine the rate of change in any (ELA, math, or science) AP or AP science course/exam taking and passing for fifty-five schools that began their participation in the AP STEM and English program in SY2013 through SY2017. We examined changes in these rates for all students and for student groups of interest including African American / Black, Hispanic/Latino, and English language learners (EL). Change in any (ELA, math, or science) AP or AP science course/exam taking and passing rates were considered in relation to percent of teachers who attended at least one APSI training, percent of teachers who attended at least one APSI training and were retained, and percent of AP teachers who are teachers of color.  The key findings are summarized below.   * Of all ELA, math, or science teachers at participating schools, 23% attended at least one APSI training and 10% attended two or more APSI trainings during the three years of the schools’ core status. * In many cases, no relationship between factors of interest (including schools’ observed rates of APSI attendance, teacher retention, and percent AP teachers of color) and student outcomes was observed.   + Among students who were EL at participating schools, there were no discernable relationships between factors of interest (including schools’ observed rates of APSI attendance, teacher retention, and percent teachers of color) and student outcomes. Among participating schools, little or no change in EL student performance was observed. * A few possible relationships between factors of interest (including schools’ observed rates of APSI attendance, teacher retention, and percent AP teachers who are teachers of color) and student outcomes were observed.   + For most outcomes and student groups, the highest performing schools tended to include those that had a high percentage (above 50%) of teachers who attended at least one APSI training and were retained three years after schools’ core status.   + In some cases, the highest performing schools tended to be those where at least 20% of all ELA, math, or science teachers attended at least one APSI training.   + Schools with the highest performing students who are African American / Black tended to be those where a minimum of 60% of teachers attended at least one APSI training and were retained three years after schools’ core status.   + Given that a minority of schools have AP teachers who are teachers of color, for most outcomes and student groups, the highest performing schools tended to be those where at most 0-20% of AP teachers were teachers of color. * Among participating schools, the change in the rate of advanced placement (AP) exam taking was generally greater than the change in AP exam passing. * Change in AP exam taking and passing rates varied by student group of interest. There was less variation in change at participating schools among students who were EL than other student groups (including all students, African American / Black students, and Hispanic/Latino students). |

Over the past 9 years, the Massachusetts Department of Elementary and Secondary Education (DESE) has contracted with the University of Massachusetts Donahue Institute (UMDI) to conduct an evaluation of the AP STEM and English program. This program is one of numerous DESE initiatives that aim to:

* increase the college and career readiness of students in the Commonwealth,
* reduce proficiency gaps and improve academic achievement for all student groups, and
* enhance the “STEM pipeline” of students who are interested in and well prepared for postsecondary education and careers in science, technology, engineering, and mathematics (including computer science).

As specified by DESE, the goals of the AP STEM and English program center on promoting student achievement in AP courses and exams, especially among historically marginalized populations, and school and teacher transformation related to the delivery and sustainment of AP programming.

To meet these program goals and track efforts to improve student achievement, DESE contracted with Mass Insight Education and Research (Mi) to implement tasks and responsibilities aligned with the purposes of the program. Mi aims to implement four key tasks in partner schools:

1. Increase participation and improve performance in AP science, mathematics, and ELA courses and on exams, with a focus on students from historically marginalized communities.
2. Increase the effectiveness of AP science, mathematics, and ELA teachers.
3. Increase the number of new and/or additional AP science, mathematics, and ELA courses offered by districts and schools in the Commonwealth.
4. Develop collaborations with other existing and/or newly established AP initiatives or organizations to build a robust and collaborative support system for students from historically marginalized communities, their parent(s)/guardian(s), and teachers.

In their work to complete these tasks, Mi is responsible for a variety of activities falling into three main tiers of assistance: (1) teacher supports, (2) student supports, and (3) school supports. Considering these three overarching types of support offered by Mi, the Year 10 and Year 9 evaluation studies focused on further exploring the outcomes uncovered in Year 8 related to any (ELA, math, or science) AP or AP science course/exam taking and passing for all students and students from historically marginalized communities, and whether schools participating in Mi’s program showed more students taking AP courses and exams. More specifically, the Year 8 report focused on evaluating whether the following program goals were met:

1. Increase student enrollment and performance in AP STEM and English courses and exams, particularly among historically marginalized populations.
2. Increase equity and access to AP STEM and English courses and exams.

As part of the Year 8 evaluation, quasi-experimental analyses[[1]](#footnote-2) specific to AP course taking and passing and AP exam taking and passing rates showed:

***AP Course Taking and Passing***

* The effect of the AP STEM and English program on the AP course taking and passing rates of historically marginalized populations was mixed.[[2]](#footnote-3)
* The program had a statistically significant positive effect on AP course taking and passing rates for students who are economically disadvantaged (p < .01), as well as for students who are not economically disadvantaged (p < .001). The rate of taking any AP course increased more for students who are not economically disadvantaged (5.62 percentage points) than it did for students who are economically disadvantaged (3.05 percentage points). Similarly, the rate of passing any AP course increased more for students who are not economically disadvantaged (4.75 percentage points) than it did for students who are economically disadvantaged (2.48 percentage points).
* The program had no statistically significant effect on AP course taking or passing rates for students who are African American / Black, Hispanic/Latino, or EL.
* The AP STEM and English program generally had a statistically significant, positive effect on student AP[[3]](#footnote-4) course taking and passing rates during the first year of participation, though results were mixed by subject and student group (e.g., ethnicity, EL status) (p-values ranged from p < .05 to p < .001). The intervention did not impact the rate of AP course taking or passing after the first year of program participation.
* The AP STEM and English program had a statistically significant positive effect on AP ELA and math course taking and passing rates during the first year of the intervention.
* The percentage of students *taking* ELA and math courses increased by 3.76 percentage points and 2.03 percentage points (respectively) more at participating schools than at similar non-participating schools during the first year of participation. For both ELA and math courses, p-values were < .001.
* The percentage of students *passing* ELA and math courses increased by 3.33 percentage points and 1.64 percentage points (respectively) more at participating schools than at similar non-participating schools during the first year of participation. For ELA courses, the p-value was <.001. For math courses, the p-value was <.01.
* The AP STEM and English program had no statistically significant effect on AP science course taking or passing rates.

***AP Exam Taking and Passing***

* The effect of the AP STEM and English program on AP exam taking and passing rates for historically underserved populations was mixed.[[4]](#footnote-5)
* The program had a statistically significant positive effect on AP exam taking and passing rates for students who are economically disadvantaged (p < .01), as well as for students who are not economically disadvantaged (p < .001). The rate of *taking* any AP exam increased more for students who are not economically disadvantaged (5.43 percentage points) than it did for students who are economically disadvantaged (2.81 percentage points). Similarly, the rate of *passing* any AP exam increased more for students who are not economically disadvantaged (2.34 percentage points) than it did for students who are economically disadvantaged (1.74 percentage points).
  + The program had no statistically significant effect on AP exam taking rates for EL.
  + The program had no statistically significant effect on AP exam passing rates for students who are African American / Black, Hispanic/Latino, Multi-Race and Non-Hispanic/Latino, EL, or students with disabilities.
* The AP STEM and English program generally had a statistically significant positive effect on student AP exam taking and passing rates during schools’ first year of participation, though results were mixed by subject and student group (p-values ranged from p < .05 to p < .001). For nearly all student groups and subjects, the intervention did not impact the rate of AP exam taking or passing after the first year of program participation.
* The AP STEM and English program had a statistically significant, positive effect on AP exam taking and passing rates for ELA, math, and any (ELA, math, or science) during the first year of the intervention (p-values ranged from p < .01 to p < .001).
* The percentage of students *taking* ELA, math, and any (ELA, math, or science) exams increased 5.15 percentage points, 2.17 percentage points, and 6.39 percentage points (respectively) more at participating schools than at similar non-participating schools during the first year of participation.
* The percentage of students *passing* math and science exams increased 0.72 percentage points and 0.93 percentage points (respectively) more at participating schools than at similar non-participating schools during the first year of participation.
* Nearly, all participating schools experienced an increase in the rate of AP exam participation during their first year of program participation. The proportion of schools that increased AP exam participation for specific academic discipline groupings during their first year of participation varied by cohort.
* Future analyses will need to account for the shrinking comparison group and growing dissimilarity between the participating schools and non-participating schools. Alternate—and perhaps less rigorous—weighting and modeling procedures should be considered.

Considering these findings, the current report (Year 10) provides a summary of descriptive quantitative analyses conducted to further explore AP course taking and passing and AP exam taking and passing rates—for all students and for students from historically marginalized communities—and aims to respond to the following questions:

1. At which participating schools did the rate of change of any (ELA, math, or science) AP course/exam taking and passing most increase (and decrease) for all students and for student groups of interest, including African American / Black, Hispanic/Latino, and EL, as a function of percent of teachers who attended at least one APSI training, percent of teachers who attended at least one APSI training and were retained, and percent of AP teachers who are teachers of color?
2. At which participating schools did the rate of change of AP science course/exam taking and passing most increase (and decrease) for all students and for student groups of interest, including African American / Black, Hispanic/Latino, and EL, as a function of percent of teachers who attended at least one APSI training, percent of teachers who attended at least one APSI training and were retained, and percent of AP teachers who are teachers of color?

UMDI used administrative data from DESE to address these questions.

# Introduction

The Massachusetts Department of Elementary and Secondary Education (DESE) is engaged in numerous initiatives to increase the college and career readiness of students in the Commonwealth, to reduce proficiency gaps and improve academic achievement for all student groups, and to enhance the “STEM pipeline” of students who are interested in and well prepared for postsecondary education and careers in science, technology, engineering, and mathematics (including computer science).

One of these initiatives is the AP STEM and English program (hereafter, “the program”). As specified by DESE, the goals[[5]](#footnote-6) of the program are to:

1. Increase AP science, mathematics, and ELA course availability, particularly at schools with limited AP science, mathematics, and ELA offerings and high percentages of students who are from historically marginalized communities.
2. Increase historically marginalized students’ participation in AP science, mathematics, and ELA courses, such that the demographics of these courses better reflect the diversity of the student population of the school and district.
3. Increase student performance in AP science, mathematics, and ELA courses.
4. Increase the number of students taking AP exams, particularly students who are from historically marginalized communities.
5. Increase the number of students scoring a 3 or higher on AP exams, particularly underrepresented minority students and students who are economically disadvantaged.
6. Increase readiness for college-level study in science, mathematics, and ELA fields.
7. Improve science, mathematics, and ELA teacher effectiveness, including content knowledge and pedagogical skills.

To meet these program goals and track efforts to improve student achievement, DESE contracted with Mass Insight Education and Research (Mi) to implement tasks and responsibilities aligned with the purposes of the program. Mi has administered the program since the initiative’s inception in 2007, including under the program’s previous name, Mass Math + Science Initiative’s (MMSI) “Advanced Placement Training and Awards Program.”

Mi’s first cohort of the program was comprised of eight schools during the 2008–09 academic year. The program welcomed its 14th cohort of schools during the 2021–22 academic year. While Mi has evolved their program to continue meeting the needs of participating schools, the key tasks implemented by the program have been consistent over time. Namely, Mi aims to do the following in each participating school:

1. Increase participation and improve performance in AP science, mathematics, and ELA courses and on exams, with a focus on students who are from historically marginalized communities.
2. Increase the effectiveness of AP science, mathematics, and ELA teachers.
3. Increase the number of new and/or additional AP science, mathematics, and ELA courses offered by districts and schools in the Commonwealth.
4. Develop collaborations with other existing and/or newly established AP initiatives or organizations to build a robust and collaborative support system for students who are from historically marginalized communities, their parent(s)/guardian(s), and teachers.

In their work to complete these tasks, Mi is responsible for a variety of activities that fall into three main tiers of assistance: (1) teacher supports, (2) student supports, and (3) school supports. Specific examples of these forms of assistance include, but are not limited to, maintaining partnerships with schools with high percentages of students who are from historically marginalized communities, encouraging recruitment of students who are from historically marginalized communities into AP science and mathematics classes, providing exam fee subsidies to students who are economically disadvantaged, and supporting professional development for STEM AP teachers.

DESE contracted with the University of Massachusetts Donahue Institute (UMDI) to conduct the evaluation of the Mi program. UMDI previously submitted interim and final evaluation reports for Years 1–9. In light of the Year 8 and Year 9 findings, this report for the Year 10 evaluation provides a summary of the descriptive quantitative analyses conducted to explore the performance of participating schools relevant to AP course taking and passing and AP exam taking and passing—for all students and for students who are from historically marginalized communities.

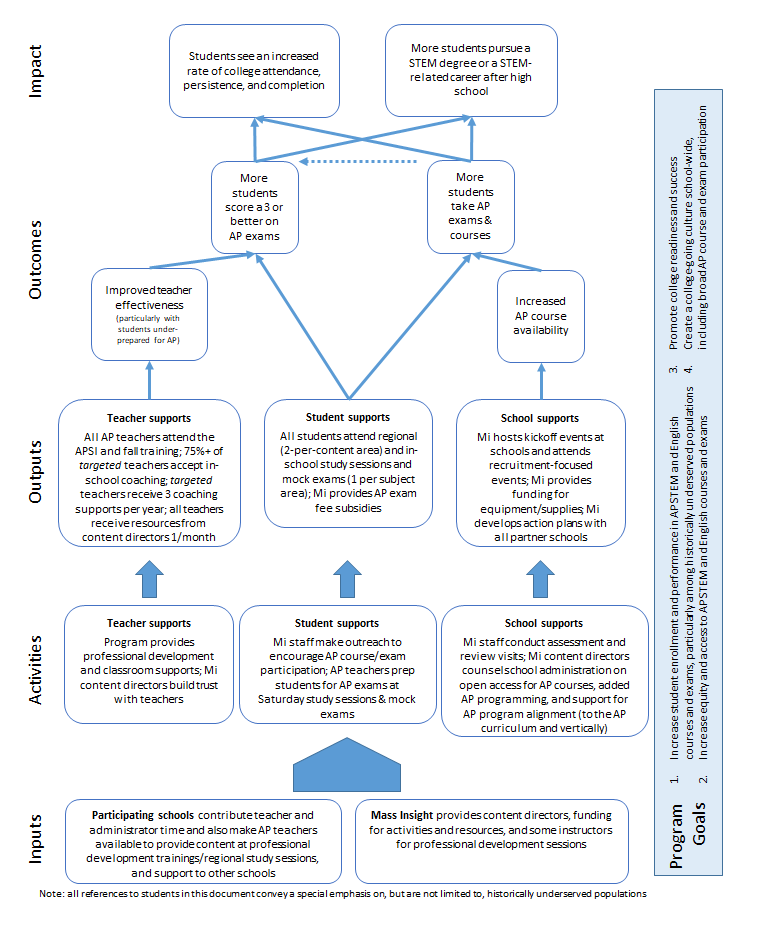
This report is organized into four main sections. The first three sections—[Evaluation Design](#_Evaluation_Design), [Data and Data Analysis](#_Data_and_Data), and [Methods](#_Methods)—provide an overarching description of the Year 10 analyses and summarizes points considered in the methods of the analyses. The fourth section—[Findings](#_Findings)—presents the key results from the descriptive quantitative analyses.

# Evaluation Design

The Year 10 evaluation was designed to expand upon the work completed during the last three years—Year 7, Year 8, and Year 9. As part of the Year 8 evaluation, a quasi-experimental analysis was used to assess program impacts on AP course taking and passing and AP exam taking and passing for participating schools.[[6]](#footnote-7) The current evaluation further builds on the analyses completed during Year 8 and is directly related to the program’s logic model (Figure 1), which was updated during Year 7. Please note, the Logic Model is aspirational. The extent to which the activities and outcomes suggested in this model have been implemented/achieved by Mi and/or participating schools has not yet been documented. UMDI acknowledges that Mi included a new Logic Model in their latest response to DESE’s call for proposals. The Logic Model from Year 7 is being referred to in the current report as, to the best of our knowledge, it best reflects the AP STEM and English program during the time periods being included in the evaluation.

**Figure 1**

*AP STEM and English Program Logic Model*

The Year 10 evaluation study further explores one of the four outcomes included in the Logic Model (see Figure 1 above)—that more students at participating schools will take and pass AP courses and exams. More specifically, the current study sheds some light on the ways in which the following two program goals are being met:

1. Increase student enrollment and performance in AP STEM and English courses and exams, particularly among historically marginalized populations.
2. Increase equity and access to AP STEM and English courses and exams.

Evaluation questions used to guide our work during Year 10 include:

1. At which participating schools did the rate of change of any (ELA, math, or science) AP course/exam taking and passing most increase (and decrease) for all students and for student groups of interest, including African American / Black, Hispanic/Latino, and EL, as a function of percent of teachers who attended at least one APSI training, percent of teachers who attended at least one APSI training and were retained, and percent of AP teachers who are teachers of color?
2. At which participating schools did the rate of change of AP science course/exam taking and passing most increase (and decrease) for all students and for student groups of interest, including African American / Black, Hispanic/Latino, and EL, as a function of percent of teachers who attended at least one APSI training, percent of teachers who attended at least one APSI training and were retained, and percent of AP teachers who are teachers of color?

To address these questions, the Year 10 report provides descriptive quantitative information summarizing (1) the identification and application of definitions of “highest performing” and “lowest performing” schools relevant to AP course taking and passing and AP exam taking and passing, (2) the identification and application of definitions of characteristics of interest (percent of teachers attending at least one APSI training, rate of teacher retention, and percent of AP teachers who are teachers of color), and (3) similarities among schools having achieved various levels of performance.

# Data and Data Analysis

This report includes a summary of descriptive analyses of schools that participated in Mi programing. Schools were characterized as highest performing or lowest performing based on AP course taking or passing for any (ELA, math, or science) AP or AP science course, as well as AP exam taking and passing for any (ELA, math, or science) AP or AP science exam for:

all students

students who are African American / Black

students who are Hispanic/Latino

students who are English language learners (EL)

“Highest Performing” and “Lowest Performing” were identified for AP course taking and passing, as well as AP exam taking and passing. Highest performing schools were defined as the top quartile of schools concerning percent change in AP course/exam taking and passing, and lowest performing schools were defined as the bottom quartile of schools concerning percent change in AP course/exam taking and passing. These definitions and concurrent analyses—which are described in further detail in the Methods section—were completed with schools that started the intervention from SY13–SY17 (Cohorts V–IX). Earlier and later cohorts are not included because the intention was to examine changes in AP course taking and passing and AP exam taking and passing three years, and six years, after initial participation. In total, 55 participating schools were included. The actual number of schools included in each analysis varied by subject, by outcome (taking/passing), and by student group.

The performance levels were further examined using characteristics specific to the schools’ teachers and the school’s AP course taking and passing and AP exam taking and passing rates (i.e., percent of teachers who attended at least one AP Summer Institute (APSI) during the schools’ three years core status, percent of teachers who attended at least one APSI during the schools’ three years of core status and were retained at school three years after core ends, and percent of AP teachers who are teachers of color). The AP Summer Institute (APSI) is a five-day training program provided by Mass Insight. This comprehensive, content-focused professional development is offered to all AP teachers to attend twice during the three years the school is in core status. Each training focuses on an AP course, to help teachers develop instructional approaches that align with the goals of AP and to identify the tasks and materials for which students might need more preparation. Instructors also share best practices and model lessons (see also the Year 7 report).

These descriptive analyses are based on AP course data, from the Student Course Schedule (SCS) data file, provided by DESE from SY11 to SY19.[[7]](#footnote-8) Data were merged with corresponding SIMS data to identify key demographic information for participating students—where participating students were those in grades 9–12 and were enrolled in schools that are part of the AP STEM and English program. The newly merged data file included key information on which students were considered AP ELA, math, and science course takers, AP course passers, AP exam takers, and AP exam passers. To be considered a course passer a student must have (1) completed the AP course, (2) earned credit, and (3) received a passing letter or numeric grade within the AP course. To be considered an exam taker, a student must have taken one or more AP ELA, math, or science exam, and to be considered an exam passer a student must have scored a three or better on at least one of their AP ELA, math, or science exams. For school-level teacher characteristics, the teacher training dataset was used to identify the percent of teachers who attended at least one APSI during the schools’ three years of core status. Then, the teacher training dataset was merged with EPIMS datasets (SY12 to SY21) to calculate the percent of teachers who attended at least one APSI during the schools’ three years of core status and were retained at their school three years after core status ends. The last characteristic, percent of AP teachers who are teachers of color, was also informed by EPIMS.

This report summarizes the results of descriptive analyses that explored the performance of schools participating in AP STEM and English relevant to AP course taking and passing as well as AP exam taking and passing. Quantitative results are presented by subject (i.e., any (ELA, math, or science) AP courses and exams, and AP science courses and exams) and student group (including all students, African American / Black, Hispanic/Latino, and EL). The results will explore the performance of participating schools relevant to AP course taking and passing and AP exam taking and passing as follows:

* the percentage point change (as a percentage)—from the year before participation began—of students taking and passing any (ELA, math, or science) AP course (or exam) or AP science course (or exam), for all students and student groups of interest, three years after intervention;
* the classification of participating schools as “highest performing” or “lowest performing” using the percentage point change in AP course (or exam) taking and passing rates; and
* examining “highest performing” and “lowest performing” participating schools for characteristics specific to the schools’ teachers and the school’s AP course (or exam) taking and passing rates (i.e., percent of teachers who attended at least one APSI during the schools’ three years of core status, percent of teachers who attended at least one APSI during the schools’ three years of core status and were retained at their school three years after core status ends, percent of AP teachers who are teachers of color).

A summary of results is presented in the “Findings” section. A full set of results are provided in [Appendix A](#_Appendix_A:_Percentage_1), [Appendix B](#_Appendix_B:_Percentage), [Appendix C](#_Appendix_C:_Assessing), and Appendix D.

# Methods

The AP STEM and English program is primarily a school-level intervention. As such, descriptive and exploratory analyses of participation and outcome data were conducted at the school level. Specifically, the performance of participating AP STEM and English schools relevant to AP course taking and passing and AP exam taking and passing—for all students and students who are from historically marginalized communities —were conducted at the school level.

During Year 8, the impacts of the AP STEM and English program were assessed for AP course taking and passing and AP exam taking and passing rates. Rates for course taking/passing were calculated as the number of students taking/passing an AP ELA, math, or science course divided by the total number of enrolled high school students in a school.[[8]](#footnote-9),[[9]](#footnote-10),[[10]](#footnote-11) Similarly, rates for exam taking/passing[[11]](#footnote-12) were calculated as the number of students taking/passing an AP ELA, math, or science exam divided by the total number of enrolled high school students in a school. These calculated AP course taking and passing and AP exam taking and passing rates are the foundation of the current analyses.

The performance of participating AP STEM and English schools relevant to AP course taking and passing and AP exam taking and passing—for all students and student groups of interest—were calculated to identify the schools that were “highest performing” and “lowest performing.” While we understand that the terms “highest performing” and “lowest performing” do not fully capture the complexities of AP course and AP exam taking and passing, for this analysis they will be used to describe the commonalities and differences among various school AP course and AP exam passing and taking rates. These analyses further quantify (descriptively) the variation in performance changes in AP course taking and passing and AP exam taking and passing that schools experience over time. This analysis does not intend to illuminate *why* this happens but rather to illustrate the extent to which it is a “real” phenomenon, and perhaps to identify similarities among schools that have achieved various outcomes.

The analyses summarized in this report are descriptive, not inferential. This report illustrates and describes patterns in the raw outcome data, and we did not control for factors—such as school size—that may contribute to (e.g., covary with or confound) the patterns described in this report. The report does not describe why specific patterns or outcomes occurred. Also, due to data availability constraints, outcomes for only a subset of participating school—those for which all necessary data were available—are represented in this report. The patterns and outcomes observed for this subset of schools may differ from outcomes for other schools that have participated in the intervention.

## Measures

The percentage point change in AP course taking or passing rates and AP exam taking or passing rates from one year before intervention to three years after intervention formed the base for exploring the performance of participating schools. The analyses focused on four course/exam types based on Year 10 analysis results: (1) any (ELA, math, or science) AP course, (2) AP science course, (3) any (ELA, math, or science) AP exam, and (4) AP science exam. Measures were calculated for all students and specific student groups of interest: (1) African American / Black, (2) Hispanic/Latino, and (3) English language learners (EL). This resulted in 32 possible measures on which to explore the performance of participating schools relevant to AP course taking and passing and AP exam taking and passing.

## Highest Performing and Lowest Performing Cutoffs

The highest and lowest performing schools were determined for each of the measures using the top and bottom quartiles (25%) of observations, respectively. In this way, schools were classified as having higher, middle, or lower levels of change in rates of AP course taking and passing and AP exam taking and passing three years after the intervention. Schools appearing in the bottom quartile of observations were described as “lowest performing” for that measure. Schools appearing in the top quartile of observations were described as “highest performing” for that measure. Schools with values for a measure being in the middle 50% of observations saw moderate or no change in performance and were described as “middle performing.” In some instances, the value indicating the boundary of the bottom quartile or top quartile of observations was the value of the measure for more than one school (most commonly, they shared a value of zero). In these instances, these schools were not included in the lowest or highest performing category.

## Characteristics

A set of three characteristics were considered when looking for similarities among the schools that achieved certain performance levels:

* percent of teachers who attended at least one APSI during the schools’ three years of core status (percent teachers who attended at least one APSI training), [[12]](#footnote-13)
* percent of teachers who attended at least one APSI during the schools’ three years of core status and were retained at school three years after core ends (percent teachers who attended at least one APSI training and were retained),[[13]](#footnote-14) and
* percent of AP teachers who are teachers of color as of third year of core status (percent AP teachers who are teachers of color).[[14]](#footnote-15)

Other characteristics could be considered in future analyses, such as dropout rates, per pupil expenditures, and student growth percentile. These were not used in the current analyses due to the scope of the evaluation.

All characteristics investigated were determined using the prepared dataset based on teacher training data (provided by Mi) and EPIMS data. These three characteristics are meant to simply describe the schools quantitatively with respect to teachers and are also (potentially) relevant to AP course taking and passing and AP exam taking and passing.

# Findings

This section presents findings related to participating schools’ performance levels—particularly with students who are from historically marginalized communities—relevant to AP course taking and passing and AP exam taking and passing. Findings are organized into three subsections:

* The first subsection summarizes the “highest performing” and “lowest performing” classifications based on the results of descriptive analyses. The plots shown in Figures 2 and 3 both illustrate the borders of the highest and lowest performing school cutoffs (i.e., the “box” of the box-and-whisker plot), and they show the overall extent to which schools saw changes in the outcomes analyzed.
* The second subsection summarizes school-level descriptive statistics related to our characteristics of interest—teachers who attended at least one APSI training, teachers who attended at least one APSI training and were retained, and AP teachers who are teachers of color.
* The third subsection explores the relationship between school performance levels and characteristics of interest—teachers who attended at least one APSI training, teachers who attended at least one APSI training and were retained, and AP teachers who are teachers of color.

The interpretation of findings within this section requires the consideration of several important notes about AP course and exam taking and passing rates, including:

***AP Course Taking and Passing***

1. Students at participating schools were considered an AP course taker if they were enrolled in one or more AP ELA, math, or science course. As the AP STEM and English program aims to increase the proportion of students enrolling in AP courses, the percentage of AP STEM and English course takers was calculated using the total number of students enrolled in 9th–12th grade at the school as the denominator—as opposed to using the total number of students enrolled in AP courses.
2. Students at participating schools were considered an AP course passer if they (1) completed the course, (2) earned credit, and (3) received a passing letter or numeric grade within at least one of the AP STEM and English courses they were enrolled in. The percentage of AP STEM and English course passers is defined as the number of students passing one or more AP course divided by the total number of students enrolled in 9th–12th grade at the school.

***AP Exam Taking and Passing***

1. Students at participating schools were considered an AP exam taker if they took one or more AP ELA, math, or science exam. As the AP STEM and English program aims to increase the proportion of students enrolling in AP exams, the percentage of AP STEM and English exam takers was calculated using the total number of students enrolled in 9th–12th grade at the school as the denominator—as opposed to using the total number of students taking AP exams for any subject.
2. Students at participating schools were considered an AP exam passer if they received a score of 3 or better for at least one of the AP STEM and English exams they took. The percentage of AP STEM and English exam passers is defined as the number of students passing one or more AP exam divided by the total number of students enrolled in 9th–12th grade at the school.

To see full results of all AP course taking and passing and AP exam taking and passing descriptive analyses, please see [Appendix A](file:///\\umdi-files.campus.ads.umass.edu\hadley5-data\ARPE%20-%20AP%20STEM\Advancing%20STEM%20AP\Year%2010\Report\AP%20STEM%20and%20English%20Year%209%20Report%202021%201223%20Accessible_TO_DESE%20COPY.docx#_Appendix_A:_Percentage), [Appendix B](file:///\\umdi-files.campus.ads.umass.edu\hadley5-data\ARPE%20-%20AP%20STEM\Advancing%20STEM%20AP\Year%2010\Report\AP%20STEM%20and%20English%20Year%209%20Report%202021%201223%20Accessible_TO_DESE%20COPY.docx#_Appendix_B:_Assessing), [Appendix C](#_Appendix_C:_Assessing), and Appendix D.

|  |
| --- |
| Summary of Key Findings |
| We completed descriptive analyses to examine the rate of change in any (ELA, math, or science) AP or AP science course/exam taking and passing for fifty-five schools that began their participation in the AP STEM and English program in SY2013 through SY2017. We examined changes in these rates for all students and for student groups of interest including African American / Black, Hispanic/Latino, and English language learners (EL). Change in any (ELA, math, or science) AP or AP science course/exam taking and passing rates were considered in relation to percent of teachers who attended at least one APSI training, percent of teachers who attended at least one APSI training and were retained, and percent of AP teachers who are teachers of color.  The key findings are summarized below.   * Of all ELA, math, or science teachers at participating schools, 23% attended at least one APSI training and 10% attended two or more APSI trainings during the three years of the schools’ core status. * In many cases, no relationship between factors of interest (including schools’ observed rates of APSI attendance, teacher retention, and percent AP teachers of color) and student outcomes was observed.   + Among students who were EL at participating schools, there were no discernable relationships between factors of interest (including schools’ observed rates of APSI attendance, teacher retention, and percent teachers of color) and student outcomes. Among participating schools, little or no change in EL student performance was observed. * A few possible relationships between factors of interest (including schools’ observed rates of APSI attendance, teacher retention, and percent AP teachers who are teachers of color) and student outcomes were observed.   + For most outcomes and student groups, the highest performing schools tended to include those that had a high percentage (above 50%) of teachers who attended at least one APSI training and were retained three years after schools’ core status.   + In some cases, the highest performing schools tended to be those where at least 20% of all ELA, math, or science teachers attended at least one APSI training.   + Schools with the highest performing students who are African American / Black tended to be those where a minimum of 60% of teachers attended at least one APSI training and were retained three years after schools’ core status.   + Given that a minority of schools have AP teachers who are teachers of color, for most outcomes and student groups, the highest performing schools tended to be those where at most 0-20% of AP teachers were teachers of color. * Among participating schools, the change in the rate of advanced placement (AP) exam taking was generally greater than the change in AP exam passing. * Change in AP exam taking and passing rates varied by student group of interest. There was less variation in change at participating schools among students who were EL than other student groups (including all students, African American / Black students, and Hispanic/Latino students). |

## Highest Performing and Lowest Performing Schools

The percentage point change in AP course taking and passing rates and AP exam taking and passing rates from the year before intervention to three years after intervention was calculated for (1) any (ELA, math, or science) AP course/exam and (2) AP science course/exam. These outcomes were assessed for each of the following groups separately:

1. all students
2. students who are African American / Black
3. students who are Hispanic/Latino
4. students who are English language learners

The top and bottom quartiles were used to identify schools that were “highest performing” and “lowest performing” with respect to each specific measure (please see the [Methods](#_Methods) for further detail).

In general, the number of highest (or lowest) performing schools varied across course taking and passing, exam taking and passing, and student group due to (1) number of schools in the sample, and (2) number of schools in the sample having a student group with .[[15]](#footnote-16) Please see [Appendix A](#_Appendix_A:_Percentage_1) and [Appendix B](#_Appendix_B:_Percentage) to view school lists and values for all measures.

As shown in Figure 2, three years after intervention, the range[[16]](#footnote-17) of participating schools’ percentage point change in AP course taking and passing from the year before intervention were larger for all students, students who are African American / Black and students who are Hispanic/Latino, and smallest for students who are EL. This pattern occurred for any (ELA, math, or science) AP and AP science course taking and passing. The very small range for EL students indicates that there was little to no change in the outcome variables during the schools’ participation in the program. In general, the ranges for AP science course taking and passing were smaller than those for any AP course taking and passing for all student groups, suggesting that there was less change in school AP course taking and passing rates after program participation. For example, most of the highest performing schools for all students concerning AP course passing for any (ELA, math, or science) AP course saw anywhere from a 10% to a 20% increase in course passing rates. In contrast, the highest performing schools for all students concerning AP science course passing saw anywhere from a 7% to a 12% increase in AP science course passing rates. In most cases, the outlying data values for students who are African American / Black were both larger and smaller than those for other student groups. Additionally, the ranges for students who are African American / Black for any AP course passing and for students who are Hispanic/Latino for AP science course passing were noticeably smaller than that for their non-EL peer student groups.

#### Figure 2

#### *Participating Schools Percentage Point Change in Any (ELA, Math, or Science) AP and AP Science Course Takers and Passers, Three Years After Intervention, by Student Group*

|  |  |
| --- | --- |
| A – Any (ELA, math, or science) AP course takers | B – AP science course takers |
|  |  |
| Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for Any (ELA, Math, or Science) AP course takers. | Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for AP science course takers. |
| C – Any (ELA, math, or science) AP course passers | D – AP science course passers |
|  |  |
| Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for Any (ELA, Math, or Science) AP course passers. | Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for AP science course passers. |

#### Figure 3

#### *Participating Schools Percentage Point Change in Any (ELA, Math, or Science) AP and AP Science Exam Takers and Passers, Three Years After Intervention, by Student Group*

|  |  |
| --- | --- |
| A – Any (ELA, math, or science) AP exam takers | B – AP science exam takers |
|  |  |
| Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for Any (ELA, Math, or Science) AP exam takers. | Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for AP science exam takers. |
| C – Any (ELA, math, or science) AP exam passers | D – AP science exam passers |
|  |  |
| Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for Any (ELA, Math, or Science) AP exam passers. | Box plot chart displaying percentage point changes on the y-axis and student groups of interests on the x-axis for AP science exam passers. |

As shown in Figure 3, the range for students who are EL for AP exams are the smallest across the board, illustrating little to no change in AP course/exam taking and passing rates. The ranges for AP science exam taking and passing also tend to be smaller than their any AP exam counterparts. For example, most of the highest performing schools for all students concerning any AP (ELA, math, or science) exam passing saw anywhere from a 5% to a 10% increase in exam passing. In contrast, most of the highest performing schools for all students concerning AP science exam passing saw anywhere from a 3% to a 6% increase in exam passing. The ranges for the remaining three student groups (all students, African American / Black, and Hispanic/Latino) tend to be similar, with some exceptions. The ranges for students who are Hispanic/Latino taking and passing AP science exams are noticeably smaller than those for all students and students who are African American / Black. The range for students who are Hispanic/Latino passing AP science exams is close to a 0% change. In most cases, the minimum and maximum values for students who are African American / Black are lower and higher, respectively, than those for the other student groups.

For most measures, the upper bound of the bottom quartile—when identifying the lowest performing schools—was approximately 0 percentage points (see Figures 2 and 3), indicating little to no change in taking or passing rates for the course/exam, subject, and student group considered. In a few cases, the cutoff for identifying the lowest performing schools was slightly above or below zero (most notably in Panel A of Figure 3).

The lower bound for the top quartile identifying the highest performing schools (see Figures 2 and 3), in contrast, was more varied.

1. For all the outcomes, the lower bound for EL students was the smallest (close to 0), representing little to no change.
2. For any AP course taking, any AP course passing, and any AP exam taking, the lower bound for most student groups, except for EL, was approximately 10% (see Panels A and C in Figure 2 and Panel A in Figure 3), indicating that highest performing schools saw at least a 10% increase for these outcomes.
3. The bounds were distinctly lower for any AP exam passing, closer to 5% change for most student groups, except for EL (see Panel C in Figure 3).
4. For AP science course/exam, the lower bounds were smaller than their any AP course/exam counterparts (see Panels B and D in Figures 2 and 3). There was more variation across groups as well. All students had the highest lower bound, followed by students who are African American / Black, and then students who are Hispanic/Latino.

These descriptive results are consistent with the following quasi-experimental results from the Year 8 analyses:

***AP Course Taking and Passing***

* The AP STEM and English program had no statistically significant effect on AP science course taking or passing rates.
* The effects of the AP STEM and English program on the AP course taking and passing rates of historically marginalized populations were mixed.
  + The program had a statistically significant positive effect on AP course taking and passing for economically disadvantaged (ECODIS) students, as well as for non-ECODIS students.
  + The program had no statistically significant effect on AP course taking or passing rates for students who are African American / Black, Hispanic/Latino, or EL.

***AP Exam Taking and Passing***

* The AP STEM and English program had no statistically significant effect on AP science exam taking and passing rates.
* The AP STEM and English program had a statistically significant, positive effect on AP exam taking and passing rates for any (ELA, math, or science) during the first year of the intervention.
* The effect of the AP STEM and English program on AP exam taking and passing rates for historically underserved populations was mixed.
  + The program had no statistically significant effect on AP exam taking rates for EL.
  + The program had no statistically significant effect on AP exam passing rates for students who are African American / Black, students who are Hispanic/Latino, and students who are EL.

## Characteristics

Two of the characteristics analyzed in this report were based on whether teachers attended at least one APSI training in either (1) any (ELA, math, or science) AP or (2) AP science, during the schools’ three years in core status. Most teachers attended anywhere from one to three APSI trainings (with a few outlier cases of teachers having attended as many as five). A cutoff value of attending at least one APSI training was chosen, in part, due to the number of teachers who attended two or more APSI trainings was small enough to threaten the ability to conduct proper analyses. Notably, 24% of all teachers at AP STEM and English program schools teaching ELA, math or science attended at least one APSI training for any (ELA, math, or science) AP course (See Table 1). In contrast, only 10% of all teachers of ELA, math, or science at those schools attended two or more APSI trainings for any (ELA, math, or science) AP. That is, only 42% of teachers who attended one APSI training in any AP course went on to attend a second training. Similarly, about 27% of all science teachers attended at least one AP science APSI training. In contrast, about 10% of all science teachers attended two or more APSI trainings for AP science. Hence, approximately 37% of AP science teachers who attended one APSI training went on to attend a second training.

The number of schools that could be included in the analyses would be severely limited if the number of trainings attended were increased from at least one APSI training attended to two or more. Initially, there were 55 schools in our sample. Five of those schools (over 9% of our sample) did not have any ELA, math or science teachers who attended two or more APSI trainings in any (ELA, math, or science) AP course. For AP science, the difference was even greater as only 29 schools had any science teachers who had attended two or more AP science APSI trainings. Please see [Appendix D](#_Appendix_D:_Number) for number and percent of each characteristic by school.

#### Table 1

*Number and Percent of Teachers Attended APSI Trainings, by AP Subject*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AP Subject** | **APSI Trainings Attended** | | | |
| **One** | **Two** | **Three or More** | **Any** |
| **Any (ELA, Math, or Science)** | 14% (262) | 9% (171) | 1% (18) | 24% (451) |
|  |
| **Science** | 17% (98) | 9% (53) | 1% (4) | 27% (155) |  |
|  |

For the second characteristic—percent teachers who attended at least one APSI training and were retained—moving from at least one APSI training attended to two or more APSI trainings attended would also substantially impact the ability to conduct analyses. First, although 44 out of 46 schools (95%) had any teachers who had attended at least one APSI in any (ELA, math, or science) AP course and then were retained three years after core status, that number is reduced to 35 schools (76%) if restricted to attendance of two or more APSI trainings. For AP science, only 37 schools (80%) had AP science teachers who attended at least one science APSI training and were retained. Only 18 schools (39%) had any teachers who attended two or more science APSI trainings and were retained. Further, Table 2 shows the number and percent of teachers that attended APSI trainings and were retained three years after the last year of core. Only 8% (8%) of teachers attended two or more APSI trainings in any (ELA, math, or science) AP (AP science) course and were retained. However, 17% (18%) of teachers attended one or more APSI trainings in any AP (AP science) course and were retained.

#### Table 2

*Number and Percent of Teachers Attended APSI Trainings and Retained Three Years After the Last Year of Core, by AP Subject*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AP Subject** | **APSI Trainings Attended and Retained Three Year After the Last Year of Core** | | | |
| **One** | **Two** | **Three or More** | **Any** |
| **Any (ELA, Math, or Science)** | 9% (153) | 7% (115) | 1% (14) | 17% (282) |
|  |
| **Science** | 11% (56) | 7% (33) | 1% (4) | 18% (93) |  |
|  |

The third and final characteristic concerned the percentage of AP teachers who were teachers of color. Approximately 7% of AP teachers were teachers of color in the average school for our analyses concerning any (ELA, math, or science) AP teachers, and 9% of AP teachers were teachers of color in the average school for our analyses concerning AP science teachers (Table 3). Thirty-three out of the 55 schools did not have any teachers of color for any (ELA, math, or science) AP course. Additionally, 39 out of the 55 schools did not have any teachers of color for AP science courses.

#### Table 3

*Number and Percent of AP Teachers Who Are Teachers of Color, by AP Subject*

|  |  |
| --- | --- |
| **AP Subject** | **AP Teachers Who Are Teachers of Color** |
|  |
| **Any (ELA, Math, or Science)** | 7% (30) |  |
|  |
| **Science** | 9% (13) |  |
|  |

## School Performance Levels and Characteristics

What follows is an attempt to identify similarities among schools that achieved various performance levels. A set of three characteristics were considered when assessing similarities:

* percent of teachers who attended at least one APSI during the schools’ three years of core status (percent teachers who attended at least one APSI training),
* percent of teachers who attended at least one APSI during the schools’ three years of core status and were retained at school three years after core ends (percent teachers who attended at least one APSI training and were retained), and
* percent of AP teachers who are teachers of color as of third year of core status (percent AP teachers who are teachers of color).

Using scatterplots, the 32 measures—varying course or exam (2), course/exam type (2), taking or passing (2), and student group (4)—were plotted against each of the three characteristics, resulting in 96 figures. Highest, middle, and lowest performing schools were indicated on the scatterplots using symbols. Numbers identify the schools. Please see [Appendix C](#_Appendix_C:_Assessing) to view all scatterplots.

***Percent Teachers Who Attended At Least One APSI Training***

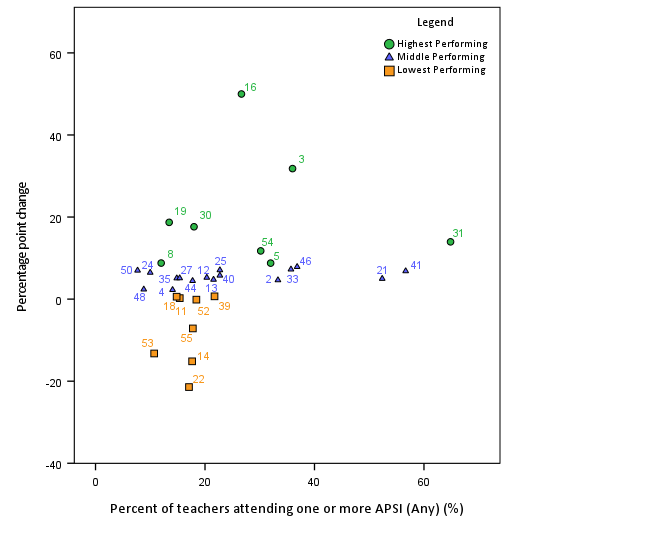
Many of the relationships observed in these analyses were categorized in one of three ways: (1) as having a ceiling, (2) as having a floor, or (3) as having a clustering pattern. Looking at Figure 4, a ceiling is present for students who are African American / Black, where the lowest performing schools in any AP course taking were those with less than 20% of teachers who attended at least one APSI training. One interpretation would be, for students who are African American / Black, schools wanting gains in any AP course taking similar to those in middle and highest performing schools' need to cross the threshold of 20% teacher attendance of at least one APSI training. These patterns were repeated for any AP exam taking and passing. For all students, the ceiling for lowest performing schools in both any (ELA, math, or science) AP course taking and passing was higher at 40% of teachers who had attended at least one APSI training session during the three years the school was in core status.

Looking at AP science course taking and passing for all students, observed relationships were not as clear. However, a floor for highest performing schools was observed at 20% of teachers attending at least one APSI science training (Figure 5). An interpretation of this finding would be that it is necessary, but not sufficient, for schools to pass the 20% teacher attendance threshold to see gains like those of the highest performing schools in AP science course taking for all students. A similar finding was observed for AP science exam taking and passing. Additionally, for students who are Hispanic/Latino, highest performing schools in AP science course passing and exam taking were found to have a floor at about 20% teachers attending at least one APSI science training.

No clear relationships were observed between teachers attending at least one APSI training and any of the four outcomes (AP course taking, AP course passing, AP exam taking, and AP exam passing) for students who are EL. In general, this is due to most schools having experienced little to no change in the outcome variables for students who are EL. Additionally, there was too much variation for any AP course taking and passing, any AP exam taking and passing, and AP science exam passing to observe any relationship between the outcomes and percent of teachers attending at least one APSI training for students who are Hispanic/Latino.

#### Figure 4

*Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI*

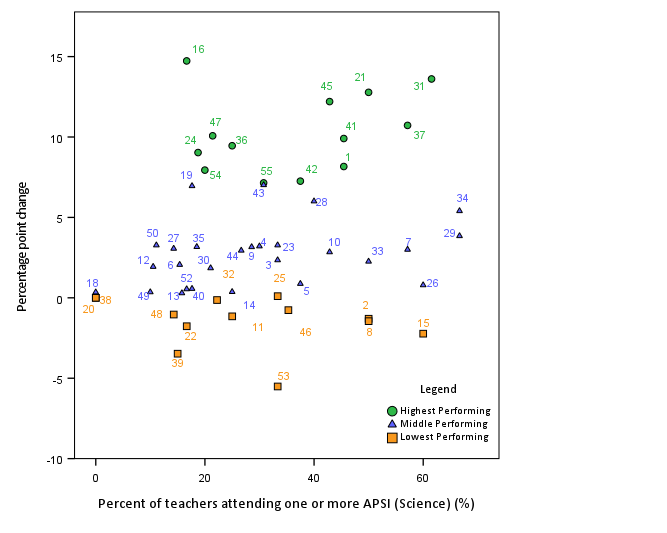


*This figure illustrates a “ceiling” of lowest performing schools at approximately 20% teachers attending one or more APSI*

#### Figure 5

*Change in Percent of AP Science Course Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI*

*This figure illustrates a “floor” of highest performing school at approximately 20% teachers attending one or more APSI*



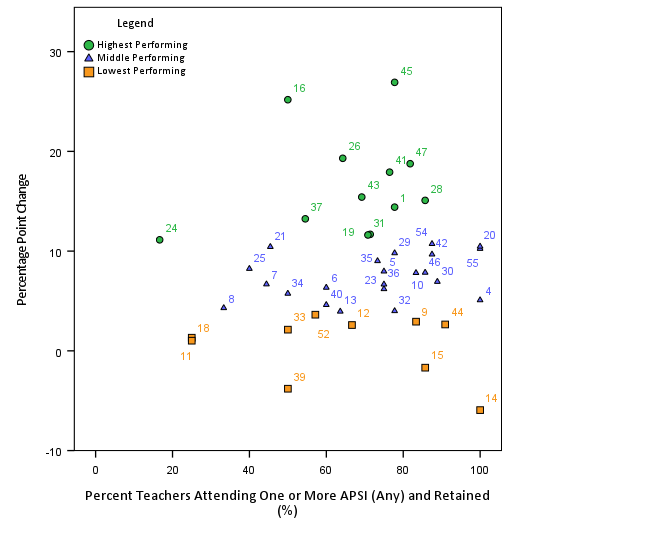
***Percent Teachers Who Attended At Least One APSI Training and Were Retained***

Looking at all students, the majority of the highest performing schools tended to cluster above 50% retainment for any AP course taking and passing and AP exam taking and passing (Figure 6). Although one school (#24) had a much lower level of teacher retention, all other highest performing schools were clearly at or above the 50% teacher retention mark. An interpretation of this finding is schools having gains similar to those of highest performing schools could work towards reaching at least 50% teacher retention. The pattern was similar for AP science taking and passing, for both course and exam. Highest performing schools for students who are African American / Black had a floor at approximately 50% teacher retainment, for both AP course passing and AP exam passing. Highest performing schools for students who are Hispanic/Latino had a floor at approximately 50% teacher retainment for AP exam passing.

#### Figure 6

*Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained*

*This figure illustrates clustering of highest performing above 50% teachers attending one or more APSI and retained*



Weaker, but notable, findings include the observation that most of the highest performing schools for any AP course taking and passing, and any AP exam taking for students who are African American / Black were above 60% teacher retainment. Further, highest performing schools were clustered above 60% teacher retainment for AP science course taking and passing, and AP science exam taking and passing. Similar relationships were found concerning students who are Hispanic/Latino as most of the highest performing schools for any AP course taking and passing, AP science course taking and passing, any AP exam taking and passing, and AP science exam taking and passing were clustered above 60% teacher retainment.

No discernable relationships were observable for students who are English language learners (EL) concerning all four outcome variables. As mentioned previously, most schools saw no change in the outcome variables from baseline to three years after intervention for this student group. Instances where schools did experience some change in the outcome variables were too few to analyze reliably.

***Percent AP Teachers Who Are Teachers of Color***

The observed patterns concerning percent AP teachers of color were noticeably similar across most student groups (with the exception of English language learners (EL)) and outcomes. For most student groups and most outcomes, highest performing schools had a ceiling between 0-20% AP teachers who were teachers of color. In some cases, a hard ceiling was observed, but in others it was closer to a strong clustering pattern. Relationships were more difficult to observe for lowest performing schools. The only notable exceptions concerned the outcomes for English language learners (EL), for which no discernable patterns were detectable. Since non-urban schools and schools where many students are white are also likely to have very low percentages of AP teachers who are teachers of color,[[17]](#footnote-18) this finding is consistent with two key findings related to students’ race/ethnicity from Year 9, specifically:

1. when considering changes in AP course taking and passing rates for all students, students who are African American / Black, students who are Hispanic/Latino, and students with disabilities, the highest performing schools were nearly always those that were not urban, and
2. when considering changes in AP course taking and passing rates for students who are African American / Black, and students who are Hispanic/Latino, the highest performing schools were generally those that had lower percentages of individuals from those student groups.

***Summary***

Overall, the trends observed with characteristics specific to AP teacher attendance of APSI trainings, AP teacher retention, and percent AP teachers who are teachers of color were not as strong as the trends observed in Year 9 using characteristics attributable to the school (e.g., School size; Student group size relative to school size; Urban-suburban-rural designation; and Percent takers/passers before intervention). In some cases, clear floor and ceiling patterns were observed, although these varied by student group and outcomes. Relationships between AP teacher attendance of APSI trainings, AP teacher retention, and percent AP teachers who are teachers of color characteristics and outcomes were particularly difficult to observe for EL students.

# Appendices

[Appendix A: Percentage Point Change in Any (ELA, Math, or Science) AP or AP Science Course Taking or Passing—Three years After Intervention](#_Appendix_A:_Percentage)

[Table A.1. Percentage Point Change in Any (ELA, Math, or Science) AP and AP Science Course Taking or Passing—Summary](#TableA1)

[Table A.2. Percent Point Change in Any AP Course Taking, Three Years After Intervention](#TableA2)

[Table A.3. Percent Point Change in AP Science Course Taking, Three years After Intervention](#TableA3)

[Table A.4. Percent Point Change in Any AP Course Passing, Three years After Intervention](#TableA4)

[Table A.5. Percent Point Change in AP Science Course Passing, Three Years After Intervention](#TableA5)

[Appendix B:](#_Appendix_B:_Assessing) Percentage Point Change in Any (ELA, Math, or Science) AP or AP Science Exam Taking or Passing—Three Years After Intervention

[Table B.1. Percentage Point Change in Any (ELA, Math, or Science) AP and AP Science Exam Course Taking or Passing—Summary](#TableB1)

[Table B.2. Percent Point Change in Any AP Exam Taking, Three Years After Intervention](#TableB2)

[Table B.3. Percent Point Change in AP Science Exam Taking, Three Years After Intervention](#TableB3)

[Table B.4. Percent Point Change in Any AP Exam Passing, Three Years After Intervention](#TableB4)

[Table B.5. Percent Point Change in AP Science Exam Passing, Three Years After Intervention](#TableB5)

Appendix C: Assessing Changes in Any (ELA, Math, or Science) AP and AP Science Course Taking or Passing and Any AP Exam or AP Science Exam Taking or Passing for Priority Student Groups—Scatterplots

[Table C.1. School key](#TableC1)

[Figure C.1.1. All students, Any (ELA, Math, or Science) AP Course Taking](#FigureC1_1)

[Figure C.1.2. All Students, AP Science Course Taking](#_Figure_B.1.2._All)

[Figure C.2.1. All Students, Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.2.1._All)

[Figure C.2.2. All Students, AP Science Course Passing](#_Figure_B.2.2._All)

[Figure C.3.1. African American / Black, Any (ELA, Math, or Science) AP Course Taking](#_Figure_B.3.1._African)

[Figure C.3.2. African American / Black, AP Science Course Taking](#_Figure_B.3.2._African)

[Figure C.4.1. African American / Black, Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.4.1._African)

[Figure C.4.2. African American / Black, AP Science Course Passing](#FigureC4_2)

[Figure C.5.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Course Taking](#_Figure_B.5.1._Hispanic/Latino,)

[Figure C.5.2. Hispanic/Latino, AP Science Course Taking](#_Figure_B.5.2._Hispanic/Latino,)

[Figure C.6.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.6.1._Hispanic/Latino,)

[Figure C.6.2. Hispanic/Latino, AP Science Course Passing](#_Figure_B.6.2._Hispanic/Latino,)

[Figure C.7.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Course Taking](#_Figure_B.7.1._English)

[Figure C.7.2. English Language Learners (EL), AP Science Course Taking](#FigureC7_2)

[Figure C.8.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.8.1._English)

[Figure C.8.2. English Language Learners (EL), AP Science Course Passing](#_Figure_B.8.2._English)

[Figure C.9.1. All Students, Any (ELA, Math, or Science) AP Exam Taking](#FigureC9_1)

[Figure C.9.2. All Students, AP Science Exam Taking](#FigureC9_2)

[Figure C.10.1. All Students, Any (ELA, Math, or Science) AP Exam Passing](#FigureC10_1)

[Figure C.10.2. All Students, AP Science Exam Passing](#_Figure_B.10.2._Students)

[Figure C.11.1. African American / Black, Any (ELA, Math, or Science) AP Exam Taking](#FigureC11_1)

[Figure C.11.2. African American / Black, AP Science Exam Taking](#FigureC11_2)

[Figure C.12.1. African American / Black, Any (ELA, Math, or Science) AP Exam Passing](#FigureC12_1)

[Figure C.12.2. African American / Black, AP Science Exam Passing](#FigureC12_2)

[Figure C.13.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Exam Taking](#FigureC13_1)

[Figure C.13.2. Hispanic/Latino, AP Science Exam Taking](#FigureC13_2)

[Figure C.14.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Exam Passing](#FigureC14_1)

[Figure C.14.2. Hispanic/Latino, AP Science Exam Passing](#FigureC14_2)

[Figure C.15.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Exam Taking](#FigureC15_1)

[Figure C.15.2. English Language Learners (EL), AP Science Exam Taking](#FigureC15_2)

[Figure C.16.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Exam Passing](#FigureC16_1)

Figure C.16.2. English Language Learners (EL), AP Science Exam Passing

[Appendix D: Number and Percent of Characteristics by School](#_Appendix_D:_Number)

[Table D.1. Number and Percent of Teachers Attended APSI Trainings, by Cohort, School and AP Subject](#_Table_D.1)

[Table D.2. Number and Percent of Teachers Attended APSI Trainings and Retained Three Years After the Last Year of Core, by Cohort, School and AP Subject](#_Table_D.2)

[Table D.3. Number and Percent of AP Teachers Who Are Teachers of Color, by Cohort, School and AP Subject](#_Table_D.3)

#### Appendix A: Percentage point change in Any (ELA, Math, or Science) AP or AP Science course taking or passing—Three years after intervention

Appendix A summarizes the descriptive statistics for schools previously determined in the Year 9 analysis. The first table provides a high-level summary, while the subsequent tables present the percentage point change of AP course takers and passers three years after intervention for each student group of interest. Each table presents the schools ordered by percentage point change with the highest performing and lowest performing schools indicated. Please see [Highest Performing and Lowest Performing Cutoffs](#_Highest_Performing_and) for more information.

[Table A.1. Percentage Point Change in Any (ELA, Math, or Science) AP and AP Science Course Taking or Passing—Summary](#TableA1)

[Table A.2. Percent Point Change in Any AP Course Taking, Three Years After Intervention](#TableA2)

[Table A.3. Percent Point Change in AP Science Course Taking, Three years After Intervention](#TableA3)

[Table A.4. Percent Point Change in Any AP Course Passing, Three years After Intervention](#TableA4)

[Table A.5. Percent Point Change in AP Science Course Passing, Three Years After Intervention](#TableA5)

#### Table A.1

#### *Percentage Point Change in Any (ELA, Math, or Science) AP or AP Science Course Taking or Passing—Summary*

|  | **Descriptive Statistics (Restricted Group Size)** | | | | | | | | | | | | | | **Cutoff** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **N** | **Minimum** | **Maximum** | **Mean** | **Median** | **Std. Deviation** | **Skewness** | | **Kurtosis** | | **Quartiles** | | | **Max of lowest** | | **Min of highest** |
| **Statistic** | **Std. Error** | **Statistic** | **Std. Error** | **25** | **50** | **75** |
|  | **AP course takers, Three years after intervention** | | | | | | | | | | | | | |  | |
| ***Any AP course takers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -12.36 | 26.93 | 7.76 | 7.68 | 6.98 | 0.18 | 0.32 | 1.40 | 0.63 | 3.62 | 7.68 | 11.14 | 3.62 | | 11.14 |
| African American / Black | 32 | -21.43 | 50.00 | 6.04 | 5.20 | 12.61 | 1.13 | 0.41 | 4.70 | 0.81 | 1.08 | 5.20 | 8.56 | 1.08 | | 8.56 |
| Hispanic/Latino | 49 | -11.82 | 19.65 | 3.97 | 4.24 | 6.80 | -0.14 | 0.34 | 0.40 | 0.67 | -0.46 | 4.24 | 9.00 | -0.46 | | 9.00 |
| English language learners | 23 | -2.29 | 23.84 | 2.05 | 0.00 | 5.77 | 3.04 | 0.48 | 9.81 | 0.93 | 0.00 | 0.00 | 1.92 | -0.48\* | | 1.92 |
| ***AP Science course takers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -5.51 | 14.74 | 3.60 | 2.95 | 4.60 | 0.60 | 0.32 | -0.25 | 0.63 | 0.30 | 2.95 | 7.02 | 0.30 | | 7.02 |
| African American / Black | 32 | -14.29 | 28.57 | 2.43 | 1.98 | 7.43 | 1.33 | 0.41 | 4.83 | 0.81 | -0.45 | 1.98 | 4.67 | -0.45 | | 4.67 |
| Hispanic/Latino | 49 | -16.67 | 20.00 | 1.02 | 0.46 | 5.32 | 0.11 | 0.34 | 4.57 | 0.67 | -0.78 | 0.46 | 3.13 | -0.78 | | 3.13 |
| English language learners | 23 | -2.70 | 23.84 | 1.84 | 0.00 | 5.29 | 3.64 | 0.48 | 14.63 | 0.93 | 0.00 | 0.00 | 1.28 | -0.14\* | | 1.28 |
|  | **AP course passers, Three years after intervention** | | | | | | | | | | | | | |  | |
| ***Any AP course passers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -10.84 | 26.93 | 7.25 | 6.17 | 6.64 | 0.43 | 0.32 | 1.09 | 0.63 | 2.35 | 6.17 | 10.03 | 2.35 | | 10.03 |
| African American / Black | 32 | -14.29 | 42.86 | 6.12 | 4.46 | 10.99 | 1.53 | 0.41 | 4.01 | 0.81 | 1.34 | 4.46 | 7.77 | 1.34 | | 7.77 |
| Hispanic/Latino | 49 | -10.45 | 19.12 | 3.73 | 3.59 | 6.18 | 0.15 | 0.34 | 0.04 | 0.67 | -0.11 | 3.59 | 8.14 | -0.11 | | 8.14 |
| English language learners | 23 | -2.18 | 15.12 | 1.17 | 0.00 | 3.48 | 3.20 | 0.48 | 12.17 | 0.93 | 0.00 | 0.00 | 1.92 | -0.76\* | | 1.92 |
| ***AP Science course passers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -4.75 | 12.21 | 3.19 | 1.93 | 4.33 | 0.46 | 0.32 | -0.65 | 0.63 | 0.06 | 1.93 | 6.76 | 0.06 | | 6.76 |
| African American / Black | 32 | -7.14 | 21.43 | 2.59 | 1.26 | 6.38 | 1.20 | 0.41 | 1.88 | 0.81 | -1.58 | 1.26 | 5.30 | -1.58 | | 5.30 |
| Hispanic/Latino | 49 | -16.67 | 15.00 | 0.83 | 0.42 | 4.67 | -0.52 | 0.34 | 4.48 | 0.67 | -0.71 | 0.42 | 2.88 | -0.71 | | 2.88 |
| English language learners | 23 | -2.70 | 15.12 | 1.06 | 0.00 | 3.35 | 3.67 | 0.48 | 15.25 | 0.93 | 0.00 | 0.00 | 0.72 | -2.07\* | | 0.72 |
| \* Cutoff was adjusted in cases where cutoff value was attributed to multiple schools. | | | |  |  |  |  |  |  |  |  |  |  |  | |  |

**Table A.2**

*Percent Point Change in Any (ELA, Math, or Science) AP Course Taking, Three Years After Intervention*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  | | --- | --- | | **All** | | | ***School Name*** | ***Percentage point change*** | | Sutton Memorial High School | 26.93 | | Drury High School | 25.19 | | Joseph Case High School | 19.31 | | Tantasqua High School | 18.77 | | Saugus High School | 17.92 | | Ayer Shirley Regional High School | 15.98 | | Shepherd Hill Regional High School | 15.42 | | Lee Middle and High School | 15.09 | | Auburn High School | 14.42 | | Wahconah Regional High School | 13.64 | | Oxford High School | 13.24 | | Fitchburg High School | 11.69 | | Melrose High School | 11.62 | | Holyoke High School | 11.14 | | Westfield High School | 10.73 | | Franklin County Technical School | 10.47 | | Gardner High School | 10.44 | | Whitman-Hanson Regional High School | 10.25 | | Leicester High School | 9.81 | | Seekonk High School | 9.68 | | Avon Middle-High School | 9.39 | | New Bedford High School | 9.02 | | Jeremiah E. Burke High School | 8.24 | | Bartlett Junior Senior High School | 7.97 | | Taconic High School | 7.86 | | Carver High School | 7.82 | | Pathfinder Regional Vocational Technical High School | 7.72 | | East Bridgewater High School | 7.68 | | Joseph P. Keefe Regional Technical School | 7.20 | | Ludlow High School | 6.94 | | Blackstone-Millville Regional High School | 6.69 | | North Brookfield High School | 6.67 | | Bay Path Regional Vocational Technical High School | 6.35 | | Granby Junior-Senior High School | 6.21 | | Nashoba Valley Technical High School | 5.75 | | Barnstable High School | 5.09 | | Urban Science Academy | 4.80 | | Roger L. Putnam Vocational Technical Academy | 4.62 | | Boston Green Academy | 4.31 | | Millbury Memorial Junior/Senior High School | 4.00 | | Chicopee High School | 3.95 | | Wareham High School | 3.62 | | Bourne High School | 2.93 | | Somerville High School | 2.64 | | Tri-County Regional Vocational Technical High School | 2.64 | | Chicopee Comprehensive High School | 2.59 | | Nantucket High School | 2.12 | | Charlestown High School | 1.32 | | Excel High School | 1.02 | | TechBoston Academy | 0.99 | | Grafton High School | 0.65 | | David Prouty High School | -1.69 | | Pittsfield High School | -3.80 | | Claremont Academy | -5.94 | | West Roxbury Academy | -12.36 | |

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| |  |  | | --- | --- | | **African American / Black** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 50.00 | | Ayer Shirley Regional High School | 31.82 | | Fitchburg High School | 18.72 | | Ludlow High School | 17.65 | | Melrose High School | 13.97 | | Westfield High School | 11.76 | | Boston Green Academy | 8.80 | | Bartlett Junior Senior High School | 8.79 | | Taconic High School | 7.88 | | Nantucket High School | 7.27 | | Jeremiah E. Burke High School | 7.09 | | Urban Science Academy | 7.01 | | Saugus High School | 6.85 | | Holyoke High School | 6.47 | | Roger L. Putnam Vocational Technical Academy | 5.78 | | Chicopee Comprehensive High School | 5.26 | | Joseph P. Keefe Regional Technical School | 5.13 | | New Bedford High School | 5.11 | | Gardner High School | 5.00 | | Chicopee High School | 4.77 | | Avon Middle-High School | 4.65 | | Somerville High School | 4.48 | | TechBoston Academy | 2.39 | | Barnstable High School | 2.28 | | Pittsfield High School | 0.68 | | Excel High School | 0.59 | | Charlestown High School | 0.24 | | Wareham High School | -0.13 | | Whitman-Hanson Regional High School | -7.14 | | West Roxbury Academy | -13.25 | | Claremont Academy | -15.16 | | Grafton High School | -21.43 | | Auburn High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Ayer Shirley Regional High School | 19.65 | | Drury High School | 19.12 | | David Prouty High School | 14.25 | | Saugus High School | 12.25 | | Bartlett Junior Senior High School | 11.59 | | Whitman-Hanson Regional High School | 11.54 | | Shepherd Hill Regional High School | 10.20 | | Ludlow High School | 10.19 | | Holyoke High School | 10.01 | | Taconic High School | 10.00 | | Fitchburg High School | 9.67 | | Lee Middle and High School | 9.52 | | Jeremiah E. Burke High School | 8.48 | | Avon Middle-High School | 8.33 | | Pathfinder Regional Vocational Technical High School | 8.11 | | Westfield High School | 7.19 | | Auburn High School | 7.08 | | Nashoba Valley Technical High School | 6.01 | | Wareham High School | 5.57 | | New Bedford High School | 5.39 | | Tantasqua High School | 5.29 | | Leicester High School | 4.81 | | Wahconah Regional High School | 4.55 | | Joseph P. Keefe Regional Technical School | 4.36 | | Gardner High School | 4.24 | | Blackstone-Millville Regional High School | 4.17 | | Chicopee High School | 3.57 | | Melrose High School | 3.43 | | Roger L. Putnam Vocational Technical Academy | 3.14 | | Chicopee Comprehensive High School | 2.42 | | Somerville High School | 1.88 | | Urban Science Academy | 1.47 | | Tri-County Regional Vocational Technical High School | 1.18 | | Excel High School | 1.03 | | Joseph Case High School | 0.00 | | Seekonk High School | 0.00 | | Bay Path Regional Vocational Technical High School | -0.22 | | Pittsfield High School | -0.70 | | TechBoston Academy | -0.74 | | Grafton High School | -1.19 | | Charlestown High School | -1.37 | | Barnstable High School | -2.26 | | Nantucket High School | -2.81 | | Boston Green Academy | -3.58 | | Oxford High School | -4.10 | | Claremont Academy | -4.43 | | Bourne High School | -10.53 | | Millbury Memorial Junior/Senior High School | -11.33 | | West Roxbury Academy | -11.82 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Holyoke High School | 23.84 | | Urban Science Academy | 13.83 | | Chicopee Comprehensive High School | 5.00 | | Jeremiah E. Burke High School | 4.41 | | Claremont Academy | 2.63 | | TechBoston Academy | 1.92 | | New Bedford High School | 0.93 | | Somerville High School | 0.76 | | Charlestown High School | 0.58 | | Barnstable High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Chicopee High School | 0.00 | | Gardner High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Nantucket High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | West Roxbury Academy | 0.00 | | Westfield High School | 0.00 | | Saugus High School | -0.48 | | Fitchburg High School | -0.76 | | Pittsfield High School | -1.15 | | Boston Green Academy | -2.18 | | Excel High School | -2.29 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

#### Table A.3

*Percent Point Change in AP Science Course Taking, Three Years After Intervention*

|  |  |
| --- | --- |
| **All** | |
| ***School Name*** | ***Percentage point change*** |
| Drury High School | 14.74 |
| Melrose High School | 13.61 |
| Gardner High School | 12.78 |
| Sutton Memorial High School | 12.21 |
| Oxford High School | 10.73 |
| Tantasqua High School | 10.08 |
| Saugus High School | 9.91 |
| North Brookfield High School | 9.46 |
| Holyoke High School | 9.04 |
| Auburn High School | 8.17 |
| Westfield High School | 7.94 |
| Seekonk High School | 7.26 |
| Whitman-Hanson Regional High School | 7.15 |
| Shepherd Hill Regional High School | 7.02 |
| Fitchburg High School | 6.96 |
| Wahconah Regional High School | 6.95 |
| Lee Middle and High School | 6.01 |
| Nashoba Valley Technical High School | 5.40 |
| East Bridgewater High School | 4.77 |
| Leicester High School | 3.85 |
| Granby Junior-Senior High School | 3.28 |
| Urban Science Academy | 3.28 |
| Barnstable High School | 3.21 |
| New Bedford High School | 3.17 |
| Bourne High School | 3.17 |
| Joseph P. Keefe Regional Technical School | 3.07 |
| Blackstone-Millville Regional High School | 3.00 |
| Somerville High School | 2.95 |
| Carver High School | 2.85 |
| Ayer Shirley Regional High School | 2.35 |
| Nantucket High School | 2.26 |
| Bay Path Regional Vocational Technical High School | 2.06 |
| Chicopee Comprehensive High School | 1.94 |
| Ludlow High School | 1.86 |
| Bartlett Junior Senior High School | 0.88 |
| Joseph Case High School | 0.79 |
| Roger L. Putnam Vocational Technical Academy | 0.57 |
| Wareham High School | 0.55 |
| Claremont Academy | 0.38 |
| Tri-County Regional Vocational Technical High School | 0.36 |
| Excel High School | 0.35 |
| Chicopee High School | 0.30 |
| Jeremiah E. Burke High School | 0.10 |
| Franklin County Technical School | 0.00 |
| Pathfinder Regional Vocational Technical High School | 0.00 |
| Millbury Memorial Junior/Senior High School | -0.14 |
| Taconic High School | -0.77 |
| TechBoston Academy | -1.04 |
| Charlestown High School | -1.15 |
| Avon Middle-High School | -1.30 |
| Boston Green Academy | -1.45 |
| Grafton High School | -1.77 |
| David Prouty High School | -2.23 |
| Pittsfield High School | -3.47 |
| West Roxbury Academy | -5.51 |

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| **African American / Black** | |
| ***School Name*** | ***Percentage point change*** |
| Drury High School | 28.57 |
| Ludlow High School | 17.65 |
| Ayer Shirley Regional High School | 13.64 |
| Melrose High School | 6.49 |
| Westfield High School | 5.88 |
| Chicopee High School | 5.41 |
| Gardner High School | 5.00 |
| Saugus High School | 4.77 |
| Holyoke High School | 4.35 |
| Claremont Academy | 4.00 |
| Fitchburg High School | 3.60 |
| Taconic High School | 3.44 |
| Urban Science Academy | 2.89 |
| Chicopee Comprehensive High School | 2.63 |
| Joseph P. Keefe Regional Technical School | 2.56 |
| Pittsfield High School | 2.38 |
| New Bedford High School | 1.58 |
| TechBoston Academy | 1.54 |
| Somerville High School | 1.32 |
| Roger L. Putnam Vocational Technical Academy | 0.36 |
| Excel High School | 0.24 |
| Jeremiah E. Burke High School | 0.19 |
| Boston Green Academy | 0.02 |
| Nantucket High School | -0.15 |
| Barnstable High School | -0.55 |
| Wareham High School | -1.49 |
| Avon Middle-High School | -2.33 |
| Charlestown High School | -3.87 |
| Bartlett Junior Senior High School | -4.55 |
| West Roxbury Academy | -6.41 |
| Whitman-Hanson Regional High School | -7.14 |
| Grafton High School | -14.29 |
| Auburn High School | . |
| Bay Path Regional Vocational Technical High School | . |
| Blackstone-Millville Regional High School | . |
| Bourne High School | . |
| Carver High School | . |
| David Prouty High School | . |
| East Bridgewater High School | . |
| Franklin County Technical School | . |
| Granby Junior-Senior High School | . |
| Joseph Case High School | . |
| Lee Middle and High School | . |
| Leicester High School | . |
| Millbury Memorial Junior/Senior High School | . |
| Nashoba Valley Technical High School | . |
| North Brookfield High School | . |
| Oxford High School | . |
| Pathfinder Regional Vocational Technical High School | . |
| Seekonk High School | . |
| Shepherd Hill Regional High School | . |
| Sutton Memorial High School | . |
| Tantasqua High School | . |
| Tri-County Regional Vocational Technical High School | . |
| Wahconah Regional High School | . |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 20.00 | | Melrose High School | 8.89 | | Tantasqua High School | 8.43 | | Holyoke High School | 7.97 | | Whitman-Hanson Regional High School | 7.69 | | Shepherd Hill Regional High School | 6.35 | | Gardner High School | 5.36 | | Fitchburg High School | 5.06 | | Westfield High School | 5.04 | | Saugus High School | 4.92 | | Ayer Shirley Regional High School | 3.86 | | Urban Science Academy | 3.24 | | Pittsfield High School | 3.03 | | Ludlow High School | 2.72 | | David Prouty High School | 2.71 | | Auburn High School | 2.63 | | Joseph P. Keefe Regional Technical School | 2.49 | | Taconic High School | 2.08 | | Wareham High School | 1.62 | | Chicopee Comprehensive High School | 1.58 | | Somerville High School | 1.49 | | Bay Path Regional Vocational Technical High School | 1.33 | | New Bedford High School | 1.28 | | Chicopee High School | 1.28 | | Roger L. Putnam Vocational Technical Academy | 0.46 | | Seekonk High School | 0.00 | | Wahconah Regional High School | 0.00 | | Lee Middle and High School | 0.00 | | Blackstone-Millville Regional High School | 0.00 | | Joseph Case High School | 0.00 | | Tri-County Regional Vocational Technical High School | 0.00 | | Pathfinder Regional Vocational Technical High School | 0.00 | | Jeremiah E. Burke High School | -0.16 | | Claremont Academy | -0.22 | | Barnstable High School | -0.37 | | Bartlett Junior Senior High School | -0.42 | | Charlestown High School | -0.58 | | Excel High School | -0.97 | | Nantucket High School | -1.52 | | Nashoba Valley Technical High School | -2.56 | | Leicester High School | -2.59 | | Boston Green Academy | -3.15 | | Oxford High School | -3.33 | | TechBoston Academy | -3.72 | | West Roxbury Academy | -4.55 | | Grafton High School | -4.64 | | Millbury Memorial Junior/Senior High School | -5.67 | | Bourne High School | -10.53 | | Avon Middle-High School | -16.67 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Holyoke High School | 23.84 | | Urban Science Academy | 8.89 | | Claremont Academy | 4.99 | | Chicopee Comprehensive High School | 2.86 | | Jeremiah E. Burke High School | 1.90 | | TechBoston Academy | 1.28 | | New Bedford High School | 0.93 | | Excel High School | 0.33 | | Somerville High School | 0.11 | | Joseph P. Keefe Regional Technical School | 0.00 | | West Roxbury Academy | 0.00 | | Boston Green Academy | 0.00 | | Gardner High School | 0.00 | | Saugus High School | 0.00 | | Nantucket High School | 0.00 | | Westfield High School | 0.00 | | Barnstable High School | 0.00 | | Fitchburg High School | 0.00 | | Chicopee High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Charlestown High School | -0.14 | | Pittsfield High School | -2.70 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

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#### Table A.4

#### *Percent Point Change in Any (ELA, Math, or Science) AP Course Passing, Three Years After Intervention*

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| |  |  | | --- | --- | | **All** | | | ***School Name*** | ***Percentage point change*** | | Sutton Memorial High School | 26.93 | | Drury High School | 20.94 | | Tantasqua High School | 18.76 | | Saugus High School | 18.72 | | Joseph Case High School | 18.35 | | Lee Middle and High School | 16.31 | | Ayer Shirley Regional High School | 15.21 | | Shepherd Hill Regional High School | 15.08 | | Auburn High School | 14.55 | | Fitchburg High School | 14.05 | | Oxford High School | 13.21 | | Wahconah Regional High School | 10.50 | | Leicester High School | 10.21 | | Seekonk High School | 10.03 | | Melrose High School | 10.02 | | Westfield High School | 9.80 | | Whitman-Hanson Regional High School | 9.64 | | Holyoke High School | 9.18 | | Franklin County Technical School | 9.03 | | Gardner High School | 8.43 | | East Bridgewater High School | 8.25 | | Avon Middle-High School | 7.86 | | Bartlett Junior Senior High School | 7.69 | | Carver High School | 7.32 | | Granby Junior-Senior High School | 6.98 | | North Brookfield High School | 6.68 | | Joseph P. Keefe Regional Technical School | 6.67 | | Bay Path Regional Vocational Technical High School | 6.17 | | Blackstone-Millville Regional High School | 6.14 | | Taconic High School | 6.04 | | Ludlow High School | 6.03 | | Millbury Memorial Junior/Senior High School | 6.00 | | Jeremiah E. Burke High School | 5.88 | | New Bedford High School | 5.50 | | Nashoba Valley Technical High School | 5.45 | | Pathfinder Regional Vocational Technical High School | 5.25 | | Barnstable High School | 4.73 | | Roger L. Putnam Vocational Technical Academy | 4.34 | | Wareham High School | 3.92 | | Bourne High School | 3.77 | | Chicopee High School | 3.66 | | Tri-County Regional Vocational Technical High School | 2.35 | | Boston Green Academy | 1.79 | | Chicopee Comprehensive High School | 1.58 | | Excel High School | 1.58 | | Grafton High School | 1.28 | | Somerville High School | 1.22 | | Charlestown High School | 1.09 | | TechBoston Academy | 0.75 | | Nantucket High School | 0.45 | | Claremont Academy | 0.07 | | Urban Science Academy | -1.12 | | David Prouty High School | -1.36 | | Pittsfield High School | -3.41 | | West Roxbury Academy | -10.84 | |

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| |  |  | | --- | --- | | **African American / Black** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 42.86 | | Ayer Shirley Regional High School | 31.82 | | Fitchburg High School | 25.65 | | Ludlow High School | 17.65 | | Melrose High School | 13.97 | | Westfield High School | 8.82 | | Bartlett Junior Senior High School | 8.79 | | Taconic High School | 7.88 | | Boston Green Academy | 7.43 | | Holyoke High School | 6.47 | | Roger L. Putnam Vocational Technical Academy | 5.78 | | Nantucket High School | 5.76 | | Chicopee Comprehensive High School | 5.26 | | Joseph P. Keefe Regional Technical School | 5.13 | | Gardner High School | 5.00 | | Chicopee High School | 4.77 | | Saugus High School | 4.14 | | Jeremiah E. Burke High School | 4.08 | | Pittsfield High School | 3.68 | | Avon Middle-High School | 3.49 | | New Bedford High School | 2.84 | | TechBoston Academy | 2.08 | | Somerville High School | 1.45 | | Wareham High School | 1.36 | | Barnstable High School | 1.34 | | Excel High School | 0.38 | | Charlestown High School | 0.26 | | Claremont Academy | 0.23 | | Urban Science Academy | -2.63 | | Whitman-Hanson Regional High School | -3.57 | | West Roxbury Academy | -11.97 | | Grafton High School | -14.29 | | Auburn High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 19.12 | | Ayer Shirley Regional High School | 17.01 | | David Prouty High School | 14.25 | | Whitman-Hanson Regional High School | 11.54 | | Saugus High School | 11.03 | | Bartlett Junior Senior High School | 10.58 | | Shepherd Hill Regional High School | 10.20 | | Fitchburg High School | 9.95 | | Lee Middle and High School | 9.52 | | Wahconah Regional High School | 9.09 | | Ludlow High School | 8.69 | | Avon Middle-High School | 8.33 | | Holyoke High School | 7.95 | | Taconic High School | 7.92 | | Jeremiah E. Burke High School | 7.72 | | Auburn High School | 7.08 | | Nashoba Valley Technical High School | 6.01 | | Westfield High School | 5.76 | | Wareham High School | 5.57 | | Tantasqua High School | 5.29 | | Leicester High School | 4.81 | | Joseph P. Keefe Regional Technical School | 4.36 | | Gardner High School | 4.24 | | Blackstone-Millville Regional High School | 4.17 | | Chicopee High School | 3.59 | | Roger L. Putnam Vocational Technical Academy | 2.82 | | Pathfinder Regional Vocational Technical High School | 2.70 | | New Bedford High School | 2.51 | | Excel High School | 2.32 | | Chicopee Comprehensive High School | 1.70 | | Melrose High School | 1.21 | | Tri-County Regional Vocational Technical High School | 1.18 | | Claremont Academy | 0.90 | | Somerville High School | 0.27 | | TechBoston Academy | 0.21 | | Joseph Case High School | 0.00 | | Seekonk High School | 0.00 | | Bay Path Regional Vocational Technical High School | -0.22 | | Charlestown High School | -0.63 | | Pittsfield High School | -0.70 | | Urban Science Academy | -2.08 | | Nantucket High School | -2.81 | | Barnstable High School | -3.02 | | Oxford High School | -4.10 | | Grafton High School | -4.64 | | Bourne High School | -5.26 | | Boston Green Academy | -5.86 | | Millbury Memorial Junior/Senior High School | -6.98 | | West Roxbury Academy | -10.45 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Holyoke High School | 15.12 | | Chicopee Comprehensive High School | 5.00 | | Urban Science Academy | 4.44 | | Claremont Academy | 2.63 | | Jeremiah E. Burke High School | 1.94 | | TechBoston Academy | 1.92 | | Charlestown High School | 0.90 | | New Bedford High School | 0.47 | | Somerville High School | 0.11 | | Barnstable High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Chicopee High School | 0.00 | | Gardner High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Nantucket High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Saugus High School | 0.00 | | West Roxbury Academy | 0.00 | | Westfield High School | 0.00 | | Fitchburg High School | -0.76 | | Pittsfield High School | -1.15 | | Excel High School | -1.63 | | Boston Green Academy | -2.18 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

#### Table A.5

*Percent Point Change in AP Science Course Passing, Three Years After Intervention*

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| **All** | |
| ***School Name*** | ***Percentage point change*** |
| Sutton Memorial High School | 12.21 |
| Melrose High School | 11.70 |
| Gardner High School | 11.32 |
| Drury High School | 10.86 |
| Oxford High School | 10.46 |
| Tantasqua High School | 9.94 |
| Saugus High School | 9.68 |
| Fitchburg High School | 9.12 |
| North Brookfield High School | 8.78 |
| Auburn High School | 8.15 |
| Seekonk High School | 7.44 |
| Westfield High School | 7.29 |
| Holyoke High School | 7.15 |
| Shepherd Hill Regional High School | 6.76 |
| Whitman-Hanson Regional High School | 6.71 |
| Wahconah Regional High School | 5.29 |
| Lee Middle and High School | 5.15 |
| Nashoba Valley Technical High School | 4.69 |
| East Bridgewater High School | 4.62 |
| Leicester High School | 3.82 |
| Bourne High School | 3.78 |
| Granby Junior-Senior High School | 3.28 |
| Joseph P. Keefe Regional Technical School | 2.80 |
| Barnstable High School | 2.80 |
| Blackstone-Millville Regional High School | 2.51 |
| Joseph Case High School | 2.29 |
| Bay Path Regional Vocational Technical High School | 2.06 |
| Nantucket High School | 1.93 |
| Carver High School | 1.87 |
| Somerville High School | 1.70 |
| New Bedford High School | 1.69 |
| Millbury Memorial Junior/Senior High School | 1.64 |
| Ludlow High School | 1.61 |
| Ayer Shirley Regional High School | 1.58 |
| Chicopee Comprehensive High School | 1.47 |
| Bartlett Junior Senior High School | 1.07 |
| Excel High School | 0.99 |
| Wareham High School | 0.84 |
| Claremont Academy | 0.77 |
| Roger L. Putnam Vocational Technical Academy | 0.43 |
| Tri-County Regional Vocational Technical High School | 0.07 |
| Jeremiah E. Burke High School | 0.06 |
| Chicopee High School | 0.01 |
| Franklin County Technical School | 0.00 |
| Pathfinder Regional Vocational Technical High School | 0.00 |
| Charlestown High School | -0.43 |
| Grafton High School | -1.15 |
| Taconic High School | -1.20 |
| David Prouty High School | -1.62 |
| TechBoston Academy | -1.78 |
| Urban Science Academy | -2.20 |
| Pittsfield High School | -3.15 |
| Boston Green Academy | -3.28 |
| Avon Middle-High School | -3.34 |
| West Roxbury Academy | -4.75 |

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| **African American / Black** | |
| ***School Name*** | ***Percentage point change*** |
| Drury High School | 21.43 |
| Ludlow High School | 17.65 |
| Ayer Shirley Regional High School | 13.64 |
| Fitchburg High School | 9.54 |
| Claremont Academy | 7.84 |
| Melrose High School | 6.49 |
| Westfield High School | 5.88 |
| Chicopee High School | 5.41 |
| Gardner High School | 5.00 |
| Pittsfield High School | 4.38 |
| Holyoke High School | 4.35 |
| Taconic High School | 3.44 |
| Chicopee Comprehensive High School | 2.63 |
| Joseph P. Keefe Regional Technical School | 2.56 |
| Saugus High School | 2.07 |
| Somerville High School | 1.32 |
| New Bedford High School | 1.20 |
| Excel High School | 1.04 |
| TechBoston Academy | 1.02 |
| Roger L. Putnam Vocational Technical Academy | 0.36 |
| Wareham High School | 0.00 |
| Nantucket High School | -0.15 |
| Jeremiah E. Burke High School | -0.33 |
| Barnstable High School | -0.55 |
| Boston Green Academy | -1.92 |
| Charlestown High School | -2.43 |
| Avon Middle-High School | -3.49 |
| Whitman-Hanson Regional High School | -3.57 |
| Urban Science Academy | -4.36 |
| Bartlett Junior Senior High School | -4.55 |
| West Roxbury Academy | -5.98 |
| Grafton High School | -7.14 |
| Auburn High School | . |
| Bay Path Regional Vocational Technical High School | . |
| Blackstone-Millville Regional High School | . |
| Bourne High School | . |
| Carver High School | . |
| David Prouty High School | . |
| East Bridgewater High School | . |
| Franklin County Technical School | . |
| Granby Junior-Senior High School | . |
| Joseph Case High School | . |
| Lee Middle and High School | . |
| Leicester High School | . |
| Millbury Memorial Junior/Senior High School | . |
| Nashoba Valley Technical High School | . |
| North Brookfield High School | . |
| Oxford High School | . |
| Pathfinder Regional Vocational Technical High School | . |
| Seekonk High School | . |
| Shepherd Hill Regional High School | . |
| Sutton Memorial High School | . |
| Tantasqua High School | . |
| Tri-County Regional Vocational Technical High School | . |
| Wahconah Regional High School | . |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 15.00 | | Melrose High School | 8.89 | | Tantasqua High School | 8.43 | | Shepherd Hill Regional High School | 6.35 | | Holyoke High School | 6.02 | | Westfield High School | 5.04 | | Fitchburg High School | 4.93 | | Saugus High School | 4.92 | | Wahconah Regional High School | 4.55 | | Whitman-Hanson Regional High School | 3.85 | | Gardner High School | 3.57 | | Pittsfield High School | 3.03 | | Ludlow High School | 2.72 | | David Prouty High School | 2.71 | | Auburn High School | 2.63 | | Joseph P. Keefe Regional Technical School | 2.49 | | Taconic High School | 2.08 | | Wareham High School | 1.62 | | Bartlett Junior Senior High School | 1.43 | | Bay Path Regional Vocational Technical High School | 1.33 | | Ayer Shirley Regional High School | 1.22 | | Chicopee Comprehensive High School | 1.06 | | Chicopee High School | 1.02 | | Jeremiah E. Burke High School | 0.68 | | Somerville High School | 0.42 | | Excel High School | 0.32 | | Roger L. Putnam Vocational Technical Academy | 0.25 | | New Bedford High School | 0.13 | | Seekonk High School | 0.00 | | Lee Middle and High School | 0.00 | | Blackstone-Millville Regional High School | 0.00 | | Joseph Case High School | 0.00 | | Tri-County Regional Vocational Technical High School | 0.00 | | Pathfinder Regional Vocational Technical High School | 0.00 | | Claremont Academy | -0.22 | | Barnstable High School | -0.37 | | Charlestown High School | -0.52 | | Urban Science Academy | -0.90 | | Millbury Memorial Junior/Senior High School | -1.32 | | Nantucket High School | -1.52 | | Nashoba Valley Technical High School | -2.56 | | Leicester High School | -2.59 | | Oxford High School | -3.33 | | TechBoston Academy | -3.64 | | West Roxbury Academy | -3.64 | | Bourne High School | -5.26 | | Boston Green Academy | -5.42 | | Grafton High School | -8.09 | | Avon Middle-High School | -16.67 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Holyoke High School | 15.12 | | Claremont Academy | 4.99 | | Chicopee Comprehensive High School | 2.86 | | TechBoston Academy | 1.28 | | Jeremiah E. Burke High School | 1.28 | | Charlestown High School | 0.72 | | New Bedford High School | 0.47 | | Excel High School | 0.33 | | Somerville High School | 0.11 | | Joseph P. Keefe Regional Technical School | 0.00 | | Urban Science Academy | 0.00 | | West Roxbury Academy | 0.00 | | Nantucket High School | 0.00 | | Boston Green Academy | 0.00 | | Saugus High School | 0.00 | | Gardner High School | 0.00 | | Barnstable High School | 0.00 | | Fitchburg High School | 0.00 | | Westfield High School | 0.00 | | Chicopee High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Pittsfield High School | -2.70 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

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#### [Appendix B:](#_Appendix_B:_Assessing) Percentage point change in Any (ELA, math, or science) AP or AP science exam taking or passing—Three years after intervention

Appendix B summarizes the descriptive statistics for schools included in the Year 10 analyses. The first table provides a high-level summary, while the subsequent tables present the percentage point change of AP exam takers and passers three years after intervention for each student group of interest. Each table presents the schools ordered by percentage point change with the highest performing and lowest performing schools indicated. Please see [Highest Performing and Lowest Performing Cutoffs](#_Highest_Performing_and) for more information.

[Table B.1. Percentage Point Change in Any (ELA, Math, or Science) AP and AP Science Exam Course Taking or Passing—Summary](#TableB1)

[Table B.2. Percent Point Change in Any AP Exam Taking, Three Years After Intervention](#TableB2)

[Table B.3. Percent Point Change in AP Science Exam Taking, Three Years After Intervention](#TableB3)

[Table B.4. Percent Point Change in Any AP Exam Passing, Three Years After Intervention](#TableB4)

[Table B.5. Percent Point Change in AP Science Exam Passing, Three Years After Intervention](#TableB5)

#### Table B.1

#### *Percentage Point Change in Any (ELA, Math, or Science) AP or AP Science Exam Taking or Passing—Summary*

|  | **Descriptive Statistics (Restricted Group Size)** | | | | | | | | | | | | | | **Cutoff** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **N** | **Minimum** | **Maximum** | **Mean** | **Median** | **Std. Deviation** | **Skewness** | | **Kurtosis** | | **Quartiles** | | | **Max of lowest** | | **Min of highest** |
| **Statistic** | **Std. Error** | **Statistic** | **Std. Error** | **25** | **50** | **75** |
|  | **AP exam takers, Three years after intervention** | | | | | | | | | | | | | |  | |
| ***Any AP exam takers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -8.44 | 25.03 | 7.25 | 6.78 | 6.34 | 0.39 | 0.32 | 0.84 | 0.6.3 | 3.57 | 6.78 | 10.13 | 3.57 | | 10.13 |
| African American / Black | 32 | -21.43 | 35.71 | 5.27 | 5.06 | 11.34 | 0.48 | 0.41 | 1.92 | 0.81 | 0.20 | 5.06 | 8.59 | 0.20 | | 8.59 |
| Hispanic/Latino | 49 | -9.63 | 19.12 | 3.26 | 2.70 | 6.26 | 0.22 | 0.34 | -0.29 | 0.67 | -0.85 | 2.70 | 8.22 | -0.85 | | 8.22 |
| English language learners | 23 | -7.14 | 5.00 | 0.81 | 0.00 | 2.32 | -1.44 | 0.48 | 5.94 | 0.93 | 0.00 | 0.00 | 2.70 | 0.00 | | 2.70 |
| ***AP science exam takers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -4.32 | 12.66 | 3.68 | 2.74 | 3.98 | 0.40 | 0.32 | -0.42 | 0.63 | 0.65 | 2.74 | 6.63 | 0.65 | | 6.63 |
| African American / Black | 32 | -14.29 | 21.43 | 2.61 | 1.54 | 6.86 | 0.63 | 0.41 | 2.04 | 0.81 | -0.11 | 1.54 | 5.30 | -0.11 | | 5.30 |
| Hispanic/Latino | 49 | -16.67 | 20.00 | 1.19 | 0.43 | 4.82 | 0.18 | 0.34 | 7.42 | 0.67 | -0.35 | 0.43 | 3.56 | -0.35 | | 3.56 |
| English language learners | 23 | 0.00 | 4.07 | 0.63 | 0.00 | 1.11 | 1.92 | 0.48 | 3.33 | 0.93 | 0.00 | 0.00 | 1.28 | 0.00 | | 1.28 |
|  | **AP exam passers, Three years after intervention** | | | | | | | | | | | | | |  | |
| ***Any AP exam passers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -1.30 | 13.77 | 3.24 | 2.50 | 3.35 | 1.08 | 0.32 | 0.84 | 0.63 | 0.60 | 2.50 | 5.10 | 0.60 | | 5.10 |
| African American / Black | 32 | -7.14 | 18.18 | 1.82 | 0.56 | 4.68 | 1.55 | 0.41 | 4.23 | 0.81 | -0.04 | 0.56 | 3.53 | -0.04 | | 3.53 |
| Hispanic/Latino | 49 | -10.82 | 16.67 | 1.12 | 0.98 | 4.52 | 0.59 | 0.34 | 2.63 | 0.67 | -0.65 | 0.38 | 3.77 | -0.65 | | 3.77 |
| English language learners | 23 | 0.00 | 5.71 | 0.42 | 0.00 | 1.32 | 3.59 | 0.48 | 13.14 | 0.93 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.00 |
| ***AP science exam passers*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
| All | 55 | -2.20 | 8.59 | 1.56 | 0.94 | 2.05 | 1.23 | 0.32 | 2.35 | 0.63 | 0.21 | 0.94 | 2.53 | 0.21 | | 2.53 |
| African American / Black | 32 | -3.57 | 11.76 | 0.94 | 0.00 | 2.70 | 2.26 | 0.41 | 7.80 | 0.81 | 0.00 | 0.00 | 1.85 | 0.00 | | 1.85 |
| Hispanic/Latino | 49 | -4.35 | 6.67 | 0.29 | 0.00 | 1.72 | 0.78 | 0.34 | 5.05 | 0.67 | 0.00 | 0.00 | 0.52 | 0.00 | | 0.52 |
| English language learners | 23 | 0.00 | 2.19 | 0.10 | 0.00 | 0.46 | 4.80 | 0.48 | 23.00 | 0.93 | 0.00 | 0.00 | 0.00 | 0.00 | | 0.00 |
| \* Cutoff was adjusted in cases where cutoff value was attributed to multiple schools. | | | |  |  |  |  |  |  |  |  |  |  |  | |  |

#### Table B.2

#### *Percent Point Change in Any (ELA, Math, or Science) AP Exam Taking, Three Years After Intervention*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  | | --- | --- | | **All** | | | ***School Name*** | ***Percentage point change*** | | Sutton Memorial High School | 25.03 | | Drury High School | 21.58 | | Joseph Case High School | 18.17 | | Ayer Shirley Regional High School | 17.97 | | Tantasqua High School | 17.11 | | Saugus High School | 16.11 | | Shepherd Hill Regional High School | 16.10 | | Lee Middle and High School | 14.57 | | Auburn High School | 14.42 | | Oxford High School | 13.17 | | Franklin County Technical School | 11.91 | | Fitchburg High School | 10.59 | | Granby Junior-Senior High School | 10.27 | | Wahconah Regional High School | 10.13 | | Seekonk High School | 9.85 | | Melrose High School | 9.51 | | Leicester High School | 9.35 | | Bartlett Junior Senior High School | 9.20 | | Whitman-Hanson Regional High School | 8.92 | | Gardner High School | 8.40 | | East Bridgewater High School | 8.30 | | Carver High School | 7.79 | | Taconic High School | 7.31 | | Westfield High School | 7.07 | | Holyoke High School | 7.06 | | Bay Path Regional Vocational Technical High School | 6.98 | | Joseph P. Keefe Regional Technical School | 6.93 | | Jeremiah E. Burke High School | 6.78 | | Ludlow High School | 6.32 | | North Brookfield High School | 6.00 | | Blackstone-Millville Regional High School | 5.89 | | Nashoba Valley Technical High School | 5.73 | | Roger L. Putnam Vocational Technical Academy | 5.66 | | Boston Green Academy | 5.15 | | Pathfinder Regional Vocational Technical High School | 4.94 | | New Bedford High School | 4.77 | | Barnstable High School | 4.53 | | David Prouty High School | 4.53 | | Pittsfield High School | 4.42 | | Chicopee High School | 4.15 | | Millbury Memorial Junior/Senior High School | 4.00 | | Bourne High School | 3.57 | | Wareham High School | 3.55 | | Grafton High School | 2.97 | | Avon Middle-High School | 2.78 | | Chicopee Comprehensive High School | 2.33 | | Charlestown High School | 1.54 | | Tri-County Regional Vocational Technical High School | 1.36 | | Somerville High School | 1.05 | | Excel High School | 0.75 | | Nantucket High School | 0.04 | | TechBoston Academy | -0.30 | | Claremont Academy | -4.64 | | West Roxbury Academy | -4.74 | | Urban Science Academy | -8.44 | |
| |  |  | | --- | --- | | **African American / Black** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 35.71 | | Ayer Shirley Regional High School | 31.82 | | Bartlett Junior Senior High School | 20.00 | | Ludlow High School | 17.65 | | Fitchburg High School | 17.40 | | Melrose High School | 12.67 | | Boston Green Academy | 10.35 | | Westfield High School | 8.82 | | Taconic High School | 7.88 | | Roger L. Putnam Vocational Technical Academy | 7.60 | | Pittsfield High School | 6.68 | | Holyoke High School | 6.47 | | Nantucket High School | 5.76 | | Jeremiah E. Burke High School | 5.31 | | Chicopee Comprehensive High School | 5.26 | | Joseph P. Keefe Regional Technical School | 5.13 | | Gardner High School | 5.00 | | Chicopee High School | 4.77 | | New Bedford High School | 3.22 | | Somerville High School | 2.66 | | Charlestown High School | 1.51 | | Wareham High School | 1.36 | | Saugus High School | 0.81 | | TechBoston Academy | 0.78 | | Avon Middle-High School | 0.00 | | Excel High School | -0.42 | | Barnstable High School | -0.55 | | Whitman-Hanson Regional High School | -3.57 | | West Roxbury Academy | -3.76 | | Urban Science Academy | -13.15 | | Claremont Academy | -13.27 | | Grafton High School | -21.43 | | Auburn High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 19.12 | | Ayer Shirley Regional High School | 14.69 | | Lee Middle and High School | 14.29 | | Bartlett Junior Senior High School | 12.01 | | Saugus High School | 11.03 | | Ludlow High School | 10.45 | | Melrose High School | 10.30 | | Shepherd Hill Regional High School | 10.20 | | Fitchburg High School | 9.29 | | Wahconah Regional High School | 9.09 | | David Prouty High School | 8.60 | | Jeremiah E. Burke High School | 8.52 | | Taconic High School | 7.92 | | Whitman-Hanson Regional High School | 7.69 | | Auburn High School | 7.08 | | Nashoba Valley Technical High School | 6.01 | | Wareham High School | 5.57 | | Holyoke High School | 4.97 | | Leicester High School | 4.81 | | Joseph P. Keefe Regional Technical School | 4.36 | | Roger L. Putnam Vocational Technical Academy | 4.30 | | Gardner High School | 4.24 | | Blackstone-Millville Regional High School | 4.17 | | Chicopee High School | 3.57 | | Pathfinder Regional Vocational Technical High School | 2.70 | | New Bedford High School | 2.66 | | Pittsfield High School | 2.35 | | Excel High School | 2.32 | | Chicopee Comprehensive High School | 2.23 | | Tri-County Regional Vocational Technical High School | 1.18 | | Avon Middle-High School | 0.00 | | Bourne High School | 0.00 | | Joseph Case High School | 0.00 | | Seekonk High School | 0.00 | | Bay Path Regional Vocational Technical High School | -0.22 | | Somerville High School | -0.64 | | TechBoston Academy | -0.66 | | Charlestown High School | -1.05 | | Boston Green Academy | -2.30 | | Tantasqua High School | -2.71 | | Nantucket High School | -2.81 | | Claremont Academy | -3.77 | | Oxford High School | -4.10 | | Barnstable High School | -4.16 | | Grafton High School | -4.64 | | Urban Science Academy | -5.92 | | West Roxbury Academy | -6.43 | | Millbury Memorial Junior/Senior High School | -6.98 | | Westfield High School | -9.63 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Chicopee Comprehensive High School | 5.00 | | Pittsfield High School | 4.26 | | Jeremiah E. Burke High School | 3.10 | | Claremont Academy | 2.89 | | Charlestown High School | 2.85 | | Boston Green Academy | 2.70 | | West Roxbury Academy | 1.44 | | Excel High School | 1.33 | | TechBoston Academy | 1.28 | | Somerville High School | 0.65 | | New Bedford High School | 0.47 | | Barnstable High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Chicopee High School | 0.00 | | Fitchburg High School | 0.00 | | Gardner High School | 0.00 | | Holyoke High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Nantucket High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Urban Science Academy | 0.00 | | Westfield High School | 0.00 | | Saugus High School | -7.14 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

#### Table B.3

#### *Percent Point Change in AP Science Exam Taking, Three Years After Intervention*

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| |  |  | | --- | --- | | **All** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 12.66 | | Sutton Memorial High School | 11.25 | | Gardner High School | 11.13 | | Oxford High School | 10.46 | | Melrose High School | 10.09 | | Tantasqua High School | 9.58 | | Westfield High School | 9.19 | | Shepherd Hill Regional High School | 8.95 | | Saugus High School | 8.85 | | North Brookfield High School | 8.78 | | Auburn High School | 8.32 | | Seekonk High School | 7.43 | | East Bridgewater High School | 6.75 | | Fitchburg High School | 6.63 | | Ayer Shirley Regional High School | 6.08 | | Whitman-Hanson Regional High School | 5.83 | | Wahconah Regional High School | 5.29 | | Lee Middle and High School | 5.15 | | Bartlett Junior Senior High School | 5.05 | | Holyoke High School | 5.03 | | Bourne High School | 4.05 | | Nashoba Valley Technical High School | 3.31 | | Granby Junior-Senior High School | 3.28 | | Leicester High School | 3.16 | | Joseph P. Keefe Regional Technical School | 3.07 | | David Prouty High School | 3.01 | | Nantucket High School | 3.01 | | Barnstable High School | 2.74 | | Joseph Case High School | 2.68 | | Carver High School | 2.34 | | Taconic High School | 2.30 | | Blackstone-Millville Regional High School | 2.29 | | New Bedford High School | 2.20 | | Bay Path Regional Vocational Technical High School | 1.97 | | Somerville High School | 1.94 | | Ludlow High School | 1.69 | | Pittsfield High School | 1.61 | | Chicopee High School | 1.56 | | Chicopee Comprehensive High School | 1.54 | | Claremont Academy | 0.88 | | Grafton High School | 0.78 | | Wareham High School | 0.65 | | Jeremiah E. Burke High School | 0.56 | | Boston Green Academy | 0.43 | | Charlestown High School | 0.36 | | Excel High School | 0.32 | | Millbury Memorial Junior/Senior High School | 0.30 | | Roger L. Putnam Vocational Technical Academy | 0.29 | | Tri-County Regional Vocational Technical High School | 0.26 | | Franklin County Technical School | 0.00 | | Pathfinder Regional Vocational Technical High School | 0.00 | | TechBoston Academy | -1.42 | | Urban Science Academy | -3.34 | | West Roxbury Academy | -3.58 | | Avon Middle-High School | -4.32 | | |
| |  |  | | --- | --- | | **African American / Black** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 21.43 | | Ludlow High School | 17.65 | | Ayer Shirley Regional High School | 13.64 | | Bartlett Junior Senior High School | 13.33 | | Melrose High School | 6.49 | | Claremont Academy | 5.88 | | Westfield High School | 5.88 | | Chicopee High School | 5.41 | | Gardner High School | 5.00 | | Holyoke High School | 4.35 | | Taconic High School | 3.44 | | Chicopee Comprehensive High School | 2.63 | | Joseph P. Keefe Regional Technical School | 2.56 | | Fitchburg High School | 2.28 | | Saugus High School | 2.07 | | Boston Green Academy | 1.62 | | New Bedford High School | 1.47 | | Somerville High School | 1.32 | | Pittsfield High School | 1.15 | | TechBoston Academy | 1.02 | | Roger L. Putnam Vocational Technical Academy | 0.36 | | Jeremiah E. Burke High School | 0.33 | | Excel High School | 0.24 | | Wareham High School | 0.00 | | Nantucket High School | -0.15 | | Barnstable High School | -0.55 | | Charlestown High School | -0.63 | | Whitman-Hanson Regional High School | -3.57 | | West Roxbury Academy | -4.44 | | Avon Middle-High School | -5.81 | | Urban Science Academy | -6.59 | | Grafton High School | -14.29 | | Auburn High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Drury High School | 20.00 | | Melrose High School | 8.89 | | Bartlett Junior Senior High School | 7.14 | | Shepherd Hill Regional High School | 6.35 | | Westfield High School | 5.04 | | Fitchburg High School | 4.93 | | Saugus High School | 4.92 | | Lee Middle and High School | 4.76 | | Wahconah Regional High School | 4.55 | | Ludlow High School | 4.48 | | Whitman-Hanson Regional High School | 3.85 | | Gardner High School | 3.57 | | Ayer Shirley Regional High School | 3.55 | | Pittsfield High School | 3.03 | | Holyoke High School | 2.92 | | Auburn High School | 2.63 | | Joseph P. Keefe Regional Technical School | 2.49 | | Taconic High School | 2.08 | | Wareham High School | 1.62 | | Chicopee Comprehensive High School | 1.58 | | Chicopee High School | 1.28 | | David Prouty High School | 0.90 | | Jeremiah E. Burke High School | 0.68 | | Claremont Academy | 0.45 | | Tantasqua High School | 0.43 | | Somerville High School | 0.42 | | New Bedford High School | 0.31 | | Charlestown High School | 0.20 | | Roger L. Putnam Vocational Technical Academy | 0.04 | | Bay Path Regional Vocational Technical High School | 0.00 | | Blackstone-Millville Regional High School | 0.00 | | Bourne High School | 0.00 | | Joseph Case High School | 0.00 | | Pathfinder Regional Vocational Technical High School | 0.00 | | Seekonk High School | 0.00 | | Tri-County Regional Vocational Technical High School | 0.00 | | Excel High School | -0.33 | | Barnstable High School | -0.37 | | Nantucket High School | -0.72 | | Millbury Memorial Junior/Senior High School | -1.32 | | Urban Science Academy | -1.72 | | Boston Green Academy | -1.86 | | Nashoba Valley Technical High School | -2.56 | | West Roxbury Academy | -2.59 | | Leicester High School | -2.59 | | TechBoston Academy | -2.86 | | Oxford High School | -3.33 | | Grafton High School | -8.09 | | Avon Middle-High School | -16.67 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Claremont Academy | 4.07 | | Chicopee Comprehensive High School | 2.86 | | Jeremiah E. Burke High School | 1.87 | | Charlestown High School | 1.84 | | Excel High School | 1.54 | | TechBoston Academy | 1.28 | | Somerville High School | 0.65 | | New Bedford High School | 0.47 | | Barnstable High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Boston Green Academy | 0.00 | | Chicopee High School | 0.00 | | Fitchburg High School | 0.00 | | Gardner High School | 0.00 | | Holyoke High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Nantucket High School | 0.00 | | Pittsfield High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Saugus High School | 0.00 | | Urban Science Academy | 0.00 | | West Roxbury Academy | 0.00 | | Westfield High School | 0.00 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

#### Table B.4

#### *Percent Point Change in Any (ELA, Math, or Science) AP Exam Passing, Three Years After Intervention*

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| |  |  | | --- | --- | | **All** | | | ***School Name*** | ***Percentage point change*** | | Sutton Memorial High School | 13.77 | | Ayer Shirley Regional High School | 10.44 | | Tantasqua High School | 10.29 | | Melrose High School | 9.69 | | Shepherd Hill Regional High School | 9.15 | | Joseph Case High School | 7.96 | | Lee Middle and High School | 7.61 | | Leicester High School | 7.51 | | Auburn High School | 7.41 | | Drury High School | 6.01 | | Wahconah Regional High School | 5.84 | | Ludlow High School | 5.68 | | Whitman-Hanson Regional High School | 5.22 | | Oxford High School | 5.10 | | Carver High School | 4.68 | | Avon Middle-High School | 4.48 | | Grafton High School | 4.38 | | Seekonk High School | 3.94 | | Gardner High School | 3.76 | | Saugus High School | 3.71 | | North Brookfield High School | 3.35 | | Nashoba Valley Technical High School | 3.34 | | Joseph P. Keefe Regional Technical School | 3.07 | | Fitchburg High School | 2.88 | | Chicopee High School | 2.80 | | Bay Path Regional Vocational Technical High School | 2.68 | | Somerville High School | 2.59 | | Wareham High School | 2.50 | | Franklin County Technical School | 2.46 | | East Bridgewater High School | 2.38 | | Taconic High School | 2.19 | | Granby Junior-Senior High School | 2.13 | | Holyoke High School | 1.74 | | Westfield High School | 1.22 | | Charlestown High School | 1.21 | | Chicopee Comprehensive High School | 1.16 | | Tri-County Regional Vocational Technical High School | 1.12 | | Boston Green Academy | 1.04 | | Roger L. Putnam Vocational Technical Academy | 1.03 | | David Prouty High School | 0.96 | | Bartlett Junior Senior High School | 0.85 | | Barnstable High School | 0.60 | | Pathfinder Regional Vocational Technical High School | 0.46 | | Bourne High School | 0.46 | | Jeremiah E. Burke High School | 0.42 | | New Bedford High School | 0.42 | | Urban Science Academy | 0.41 | | Millbury Memorial Junior/Senior High School | 0.13 | | Excel High School | 0.09 | | West Roxbury Academy | 0.00 | | Blackstone-Millville Regional High School | -0.24 | | Pittsfield High School | -0.42 | | Nantucket High School | -1.11 | | TechBoston Academy | -1.26 | | Claremont Academy | -1.30 | |

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| |  |  | | --- | --- | | **African American / Black** | | | ***School Name*** | ***Percentage point change*** | | Ayer Shirley Regional High School | 18.18 | | Ludlow High School | 11.76 | | Melrose High School | 7.79 | | Drury High School | 7.14 | | Nantucket High School | 6.06 | | Gardner High School | 5.00 | | Fitchburg High School | 4.60 | | Somerville High School | 3.72 | | Westfield High School | 2.94 | | Taconic High School | 2.26 | | Chicopee High School | 2.07 | | Boston Green Academy | 1.23 | | Pittsfield High School | 1.23 | | Excel High School | 1.01 | | Wareham High School | 0.68 | | Roger L. Putnam Vocational Technical Academy | 0.68 | | Charlestown High School | 0.45 | | New Bedford High School | 0.41 | | Jeremiah E. Burke High School | 0.08 | | Avon Middle-High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Chicopee Comprehensive High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | West Roxbury Academy | 0.00 | | Holyoke High School | -0.05 | | Urban Science Academy | -0.41 | | TechBoston Academy | -0.50 | | Barnstable High School | -1.49 | | Claremont Academy | -1.89 | | Whitman-Hanson Regional High School | -3.57 | | Saugus High School | -3.96 | | Grafton High School | -7.14 | | Auburn High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | |

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| |  |  | | --- | --- | | **Hispanic/Latino** | | | ***School Name*** | ***Percentage point change*** | | Avon Middle-High School | 16.67 | | Joseph Case High School | 10.00 | | Melrose High School | 8.89 | | Auburn High School | 7.89 | | Ayer Shirley Regional High School | 6.79 | | Gardner High School | 5.36 | | Drury High School | 5.00 | | Lee Middle and High School | 4.76 | | Wahconah Regional High School | 4.55 | | Ludlow High School | 4.48 | | Shepherd Hill Regional High School | 3.85 | | Whitman-Hanson Regional High School | 3.85 | | Saugus High School | 3.69 | | Nashoba Valley Technical High School | 2.86 | | Chicopee High School | 2.59 | | Wareham High School | 2.33 | | Fitchburg High School | 1.86 | | Excel High School | 1.45 | | Holyoke High School | 1.43 | | Bartlett Junior Senior High School | 1.01 | | Joseph P. Keefe Regional Technical School | 0.93 | | David Prouty High School | 0.90 | | Roger L. Putnam Vocational Technical Academy | 0.83 | | Jeremiah E. Burke High School | 0.80 | | New Bedford High School | 0.38 | | Somerville High School | 0.26 | | Chicopee Comprehensive High School | 0.19 | | Charlestown High School | 0.15 | | Bay Path Regional Vocational Technical High School | 0.00 | | Blackstone-Millville Regional High School | 0.00 | | Boston Green Academy | 0.00 | | Bourne High School | 0.00 | | Pathfinder Regional Vocational Technical High School | 0.00 | | Pittsfield High School | 0.00 | | Seekonk High School | 0.00 | | Urban Science Academy | 0.00 | | West Roxbury Academy | 0.00 | | Leicester High School | -1.30 | | Claremont Academy | -1.33 | | Tri-County Regional Vocational Technical High School | -2.27 | | Taconic High School | -2.50 | | Tantasqua High School | -2.71 | | TechBoston Academy | -2.77 | | Oxford High School | -3.33 | | Grafton High School | -4.64 | | Barnstable High School | -4.92 | | Millbury Memorial Junior/Senior High School | -5.67 | | Nantucket High School | -6.78 | | Westfield High School | -10.82 | | Carver High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | North Brookfield High School | . | | Sutton Memorial High School | . | |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Chicopee Comprehensive High School | 5.71 | | Charlestown High School | 2.99 | | Somerville High School | 0.65 | | New Bedford High School | 0.23 | | Barnstable High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Boston Green Academy | 0.00 | | Chicopee High School | 0.00 | | Claremont Academy | 0.00 | | Excel High School | 0.00 | | Fitchburg High School | 0.00 | | Gardner High School | 0.00 | | Holyoke High School | 0.00 | | Jeremiah E. Burke High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Nantucket High School | 0.00 | | Pittsfield High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Saugus High School | 0.00 | | TechBoston Academy | 0.00 | | Urban Science Academy | 0.00 | | West Roxbury Academy | 0.00 | | Westfield High School | 0.00 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

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**Table B.5**

*Percent Point Change in AP Science Exam Passing, Three Years After Intervention*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  | | --- | --- | | **All** | | | ***School Name*** | ***Percentage point change*** | | Melrose High School | 8.59 | | Sutton Memorial High School | 7.49 | | Tantasqua High School | 5.58 | | Shepherd Hill Regional High School | 4.69 | | Gardner High School | 4.28 | | Ayer Shirley Regional High School | 3.89 | | Auburn High School | 3.60 | | Whitman-Hanson Regional High School | 3.60 | | North Brookfield High School | 3.38 | | Wahconah Regional High School | 3.37 | | Seekonk High School | 3.33 | | Drury High School | 3.00 | | Leicester High School | 2.88 | | Westfield High School | 2.53 | | Saugus High School | 2.51 | | Ludlow High School | 2.45 | | Bourne High School | 2.25 | | Oxford High School | 2.21 | | Fitchburg High School | 2.16 | | East Bridgewater High School | 2.15 | | Wareham High School | 1.81 | | David Prouty High School | 1.66 | | Lee Middle and High School | 1.29 | | Nantucket High School | 1.25 | | Somerville High School | 1.22 | | Joseph Case High School | 0.96 | | Charlestown High School | 0.94 | | Bartlett Junior Senior High School | 0.94 | | Joseph P. Keefe Regional Technical School | 0.93 | | Grafton High School | 0.89 | | Granby Junior-Senior High School | 0.82 | | Chicopee Comprehensive High School | 0.81 | | Carver High School | 0.74 | | Taconic High School | 0.65 | | Bay Path Regional Vocational Technical High School | 0.63 | |  |  | | Nashoba Valley Technical High School | 0.58 | | Holyoke High School | 0.44 | | Excel High School | 0.42 | | Boston Green Academy | 0.35 | | Urban Science  Academy | 0.31 | | Chicopee High School | 0.25 | | Barnstable High School | 0.21 | | Roger L. Putnam Vocational Technical Academy | 0.14 | | Blackstone-Millville Regional High School | 0.04 | | New Bedford High School | 0.03 | | Franklin County Technical School | 0.00 | | Pathfinder Regional Vocational Technical High School | 0.00 | | West Roxbury Academy | 0.00 | | Tri-County Regional Vocational Technical High School | -0.01 | | Jeremiah E. Burke High School | -0.17 | | Claremont Academy | -0.40 | | Avon Middle-High School | -0.60 | | TechBoston Academy | -0.97 | | Millbury Memorial Junior/Senior High School | -1.97 | | Pittsfield High School | -2.20 | |

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| |  |  | | --- | --- | | **African American / Black** | | | ***School Name*** | ***Percentage point change*** | | Ludlow High School | 11.76 | | Chicopee High School | 5.41 | | Ayer Shirley Regional High School | 4.55 | | Melrose High School | 3.90 | | Westfield High School | 2.94 | | Saugus High School | 2.70 | | Taconic High School | 2.35 | | Fitchburg High School | 1.97 | | Nantucket High School | 1.52 | | Boston Green Academy | 0.61 | | Excel High School | 0.51 | | New Bedford High School | 0.48 | | TechBoston Academy | 0.29 | | Somerville High School | 0.04 | | Bartlett Junior Senior High School | 0.00 | | Chicopee Comprehensive High School | 0.00 | | Claremont Academy | 0.00 | | Drury High School | 0.00 | | Gardner High School | 0.00 | | Grafton High School | 0.00 | | Holyoke High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Urban Science Academy | 0.00 | | Wareham High School | 0.00 | | West Roxbury Academy | 0.00 | | Jeremiah E. Burke High School | -0.22 | | Charlestown High School | -0.27 | | Pittsfield High School | -1.00 | | Barnstable High School | -1.49 | | Avon Middle-High School | -2.33 | | Whitman-Hanson Regional High School | -3.57 | | Auburn High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | |

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| --- | --- |
| **Hispanic/Latino** | |
| ***School Name*** | ***Percentage point change*** |
| Melrose High School | 6.67 |
| Wahconah Regional High School | 4.55 |
| Shepherd Hill Regional High School | 3.17 |
| Ludlow High School | 2.99 |
| Saugus High School | 2.44 |
| Gardner High School | 1.79 |
| Fitchburg High School | 1.48 |
| Bartlett Junior Senior High School | 1.43 |
| Chicopee High School | 1.05 |
| David Prouty High School | 0.90 |
| Westfield High School | 0.72 |
| Chicopee Comprehensive High School | 0.53 |
| Charlestown High School | 0.52 |
| Tantasqua High School | 0.43 |
| Joseph P. Keefe Regional Technical School | 0.31 |
| Holyoke High School | 0.14 |
| Roger L. Putnam Vocational Technical Academy | 0.11 |
| Auburn High School | 0.00 |
| Avon Middle-High School | 0.00 |
| Bay Path Regional Vocational Technical High School | 0.00 |
| Blackstone-Millville Regional High School | 0.00 |
| Boston Green Academy | 0.00 |
| Bourne High School | 0.00 |
| Claremont Academy | 0.00 |
| Drury High School | 0.00 |
| Excel High School | 0.00 |
| Jeremiah E. Burke High School | 0.00 |
| Joseph Case High School | 0.00 |
| Lee Middle and High School | 0.00 |
| Nashoba Valley Technical High School | 0.00 |
| Oxford High School | 0.00 |
| Pathfinder Regional Vocational Technical High School | 0.00 |
| Pittsfield High School | 0.00 |
| Seekonk High School | 0.00 |
| Taconic High School | 0.00 |
| Tri-County Regional Vocational Technical High School | 0.00 |
| Urban Science Academy | 0.00 |
| Wareham High School | 0.00 |
| West Roxbury Academy | 0.00 |
| Whitman-Hanson Regional High School | 0.00 |
| New Bedford High School | -0.06 |
| Somerville High School | -0.42 |
| Nantucket High School | -0.72 |
| TechBoston Academy | -0.87 |
| Barnstable High School | -1.14 |
| Leicester High School | -1.30 |
| Ayer Shirley Regional High School | -2.02 |
| Grafton High School | -4.24 |
| Millbury Memorial Junior/Senior High School | -4.35 |
| Carver High School | . |
| East Bridgewater High School | . |
| Franklin County Technical School | . |
| Granby Junior-Senior High School | . |
| North Brookfield High School | . |
| Sutton Memorial High School | . |

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| |  |  | | --- | --- | | **English language learners (EL)** | | | ***School Name*** | ***Percentage point change*** | | Charlestown High School | 2.19 | | Barnstable High School | 0.00 | | Bartlett Junior Senior High School | 0.00 | | Boston Green Academy | 0.00 | | Chicopee Comprehensive High School | 0.00 | | Chicopee High School | 0.00 | | Claremont Academy | 0.00 | | Excel High School | 0.00 | | Fitchburg High School | 0.00 | | Gardner High School | 0.00 | | Holyoke High School | 0.00 | | Jeremiah E. Burke High School | 0.00 | | Joseph P. Keefe Regional Technical School | 0.00 | | Nantucket High School | 0.00 | | New Bedford High School | 0.00 | | Pittsfield High School | 0.00 | | Roger L. Putnam Vocational Technical Academy | 0.00 | | Saugus High School | 0.00 | | Somerville High School | 0.00 | | TechBoston Academy | 0.00 | | Urban Science Academy | 0.00 | | West Roxbury Academy | 0.00 | | Westfield High School | 0.00 | | Auburn High School | . | | Avon Middle-High School | . | | Ayer Shirley Regional High School | . | | Bay Path Regional Vocational Technical High School | . | | Blackstone-Millville Regional High School | . | | Bourne High School | . | | Carver High School | . | | David Prouty High School | . | | Drury High School | . | | East Bridgewater High School | . | | Franklin County Technical School | . | | Grafton High School | . | | Granby Junior-Senior High School | . | | Joseph Case High School | . | | Lee Middle and High School | . | | Leicester High School | . | | Ludlow High School | . | | Melrose High School | . | | Millbury Memorial Junior/Senior High School | . | | Nashoba Valley Technical High School | . | | North Brookfield High School | . | | Oxford High School | . | | Pathfinder Regional Vocational Technical High School | . | | Seekonk High School | . | | Shepherd Hill Regional High School | . | | Sutton Memorial High School | . | | Taconic High School | . | | Tantasqua High School | . | | Tri-County Regional Vocational Technical High School | . | | Wahconah Regional High School | . | | Wareham High School | . | | Whitman-Hanson Regional High School | . | |

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#### Appendix C: Assessing changes in Any (ELA, math, or science) AP course or AP science course taking or passing and Any (ELA, math, or science) AP exam or AP science exam taking or passing for priority student groups—Scatterplots

Appendix C contains scatterplots to assess changes in AP course taking and passing and AP exam taking and passing for Any (ELA, math, or science) AP course/exam and AP science course/exam for priority student groups.

There is one figure for each of Any (ELA, math, or science) AP course taking and passing, AP science course taking and passing, Any (ELA, math, or science) AP exam taking and passing, and AP science exam taking and passing. Each figure contains panels for outcomes three years after intervention, by three characteristics: (A) percent of teachers who attended at least one APSI, (B) percent of teachers who attended at least one APSI and were retained, and (C) percent of AP teachers who are teachers of color.

[Table C.1. School key](#TableC1)

[Figure C.1.1. All students, Any (ELA, Math, or Science) AP Course Taking](#FigureC1_1)

[Figure C.1.2. All Students, AP Science Course Taking](#_Figure_B.1.2._All)

[Figure C.2.1. All Students, Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.2.1._All)

[Figure C.2.2. All Students, AP Science Course Passing](#_Figure_B.2.2._All)

[Figure C.3.1. African American / Black, Any (ELA, Math, or Science) AP Course Taking](#_Figure_B.3.1._African)

[Figure C.3.2. African American / Black, AP Science Course Taking](#_Figure_B.3.2._African)

[Figure C.4.1. African American / Black, Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.4.1._African)

[Figure C.4.2. African American / Black, AP Science Course Passing](#FigureC4_2)

[Figure C.5.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Course Taking](#_Figure_B.5.1._Hispanic/Latino,)

[Figure C.5.2. Hispanic/Latino, AP Science Course Taking](#_Figure_B.5.2._Hispanic/Latino,)

[Figure C.6.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.6.1._Hispanic/Latino,)

[Figure C.6.2. Hispanic/Latino, AP Science Course Passing](#_Figure_B.6.2._Hispanic/Latino,)

[Figure C.7.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Course Taking](#_Figure_B.7.1._English)

[Figure C.7.2. English Language Learners (EL), AP Science Course Taking](#FigureC7_2)

[Figure C.8.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Course Passing](#_Figure_B.8.1._English)

[Figure C.8.2. English Language Learners (EL), AP Science Course Passing](#_Figure_B.8.2._English)

[Figure C.9.1. All Students, Any (ELA, Math, or Science) AP Exam Taking](#FigureC9_1)

[Figure C.9.2. All Students, AP Science Exam Taking](#FigureC9_2)

[Figure C.10.1. All Students, Any (ELA, Math, or Science) AP Exam Passing](#FigureC10_1)

[Figure C.10.2. All Students, AP Science Exam Passing](#_Figure_B.10.2._Students)

[Figure C.11.1. African American / Black, Any (ELA, Math, or Science) AP Exam Taking](#FigureC11_1)

[Figure C.11.2. African American / Black, AP Science Exam Taking](#FigureC11_2)

[Figure C.12.1. African American / Black, Any (ELA, Math, or Science) AP Exam Passing](#FigureC12_1)

[Figure C.12.2. African American / Black, AP Science Exam Passing](#FigureC12_2)

[Figure C.13.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Exam Taking](#FigureC13_1)

[Figure C.13.2. Hispanic/Latino, AP Science Exam Taking](#FigureC13_2)

[Figure C.14.1. Hispanic/Latino, Any (ELA, Math, or Science) AP Exam Passing](#FigureC14_1)

[Figure C.14.2. Hispanic/Latino, AP Science Exam Passing](#FigureC14_2)

[Figure C.15.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Exam Taking](#FigureC15_1)

[Figure C.15.2. English Language Learners (EL), AP Science Exam Taking](#FigureC15_2)

[Figure C.16.1. English Language Learners (EL), Any (ELA, Math, or Science) AP Exam Passing](#FigureC16_1)

Figure C.16.2. English Language Learners (EL), AP Science Exam Passing

**Table C.1**

*School Key*

| **School Name** | **Number ID** | **School Code** |
| --- | --- | --- |
| Auburn High School | 1 | 00170505 |
| Avon Middle-High School | 2 | 00180510 |
| Ayer Shirley Regional High School | 3 | 06160505 |
| Barnstable High School | 4 | 00200505 |
| Bartlett Junior Senior High School | 5 | 03160505 |
| Bay Path Regional Vocational Technical High School | 6 | 08760605 |
| Blackstone-Millville Regional High School | 7 | 06220505 |
| Boston Green Academy | 8 | 04110305 |
| Bourne High School | 9 | 00360505 |
| Carver High School | 10 | 00520405 |
| Charlestown High School | 11 | 00350515 |
| Chicopee Comprehensive High School | 12 | 00610510 |
| Chicopee High School | 13 | 00610505 |
| Claremont Academy | 14 | 03480350 |
| David Prouty High School | 15 | 07670505 |
| Drury High School | 16 | 02090505 |
| East Bridgewater High School | 17 | 00830505 |
| Excel High School | 18 | 00350522 |
| Fitchburg High School | 19 | 00970505 |
| Franklin County Technical School | 20 | 08180605 |
| Gardner High School | 21 | 01030505 |
| Grafton High School | 22 | 01100505 |
| Granby Junior-Senior High School | 23 | 01110505 |
| Holyoke High School | 24 | 01370505 |
| Jeremiah E. Burke High School | 25 | 00350525 |
| Joseph Case High School | 26 | 02920505 |
| Joseph P. Keefe Regional Technical School | 27 | 08290605 |
| Lee Middle and High School | 28 | 01500505 |
| Leicester High School | 29 | 01510505 |
| Ludlow High School | 30 | 01610505 |
| Melrose High School | 31 | 01780505 |
| Millbury Memorial Junior/Senior High School | 32 | 01860505 |
| Nantucket High School | 33 | 01970505 |
| Nashoba Valley Technical High School | 34 | 08520605 |
| New Bedford High School | 35 | 02010505 |
| North Brookfield High School | 36 | 02150505 |
| Oxford High School | 37 | 02260505 |
| Pathfinder Regional Vocational Technical High School | 38 | 08600605 |
| Pittsfield High School | 39 | 02360505 |
| Roger L. Putnam Vocational Technical Academy | 40 | 02810620 |
| Saugus High School | 41 | 02620505 |
| Seekonk High School | 42 | 02650505 |
| Shepherd Hill Regional High School | 43 | 06580505 |
| Somerville High School | 44 | 02740505 |
| Sutton Memorial High School | 45 | 02900510 |
| Taconic High School | 46 | 02360510 |
| Tantasqua High School | 47 | 07700505 |
| TechBoston Academy | 48 | 00350657 |
| Tri-County Regional Vocational Technical High School | 49 | 08780605 |
| Urban Science Academy | 50 | 00350579 |
| Wahconah Regional High School | 51 | 06350505 |
| Wareham High School | 52 | 03100505 |
| West Roxbury Academy | 53 | 00350658 |
| Westfield High School | 54 | 03250505 |
| Whitman-Hanson Regional High School | 55 | 07800505 |

#### Figure C.1.1

#### *All students, Any (ELA, Math, or Science) AP Course Taking*

|  |  |
| --- | --- |
| A - Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B - Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course takers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.1.2

#### *All Students, AP Science Course Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course takers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Course Takers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

**Figure C.2.1**

*All Students, Any (ELA, Math, or Science) AP Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course passers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

**Figure C.2.2**

*All students, AP Science Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course passers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Course Passers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.3.1

#### *African American / Black Students, Any (ELA, Math, or Science) AP Course Taking*

|  |  |  |
| --- | --- | --- |
| A - Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained | |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course takers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. | |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color | |  |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. | |  |

#### Figure C.3.2

#### *African American / Black Students, AP Science Course Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course takers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Course Takers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.4.1

#### *African American / Black Students, Any (ELA, Math, or Science) AP Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI  Scatterplot showing percentage point change of any AP course passers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention | B – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained  Scatterplot showing percentage point change of any AP course passers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

**Figure C.4.2**

*African American / Black Students, AP Science Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course passers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of AP Science Course Passers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.5.1

#### *Hispanic/Latino, Any (ELA, Math, or Science) AP Course Taking*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―Hispanic/Latino, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.5.2

#### *Hispanic/Latino, AP Science Course Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Course Takers―Three Years After Intervention―Hispanic/Latino, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.6.1

#### *Hispanic/Latino, Any (ELA, Math, or Science) AP Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―Hispanic/Latino, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

**Figure C.6.2**

*Hispanic/Latino, AP Science Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of AP Science Course Passers―Three Years After Intervention―Hispanic/Latino, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

**Figure C.7.1**

*English Language Learners (EL), Any (ELA, Math, or Science) AP Course Taking*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Takers―Three Years After Intervention―English Language Learners, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course takers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.7.2

#### *English Language Learners (EL), AP Science Course Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of AP Science Course Takers―Three Years After Intervention―English Language Learners, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course takers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.8.1

#### *English Language Learners (EL), Any (ELA, Math, or Science) AP Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP course passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Course Passers―Three Years After Intervention―English Language Learners, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP course passers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.8.2

#### *English Language Learners (EL), AP Science Course Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Course Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Course Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science course passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of AP Science Course Passers―Three Years After Intervention―English Language Learners, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science course passers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.9.1

#### *All students, Any (ELA, Math, or Science) AP Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam takers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.9.2

#### *All Students, AP Science Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Takers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam takers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Exam Takers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.10.1

#### *All students, Any (ELA, Math, or Science) AP Exam Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam passers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam  Passers―Three Years After Intervention―All Students, by Percent of  Teachers who are Teachers of Color |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |

#### Figure C.10.2

#### *All Students, AP Science Exam Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Passers―Three Years After Intervention―All Students, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for All students and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam passers on Y-axis for All students and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Exam Passers―Three Years After Intervention―All Students, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for All students and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.11.1

#### *African American / Black Students, Any (ELA, Math, or Science) AP Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam takers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam  Takers―Three Years After Intervention―African American / Black, by  Percent of Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.11.2.

#### *African American / Black Students, AP Science Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Takers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam takers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

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| --- | --- |
| C – Change in Percent of AP Science Exam Takers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.12.1

#### *African American / Black Students, Any (ELA, Math, or Science) AP Exam Passing*

|  |  |
| --- | --- |
| A –Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam passers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.12.2

#### *African American / Black Students, AP Science Exam Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Passers―Three Years After Intervention―African American / Black, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for African American/Black and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam passers on Y-axis for African American/Black and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Exam Passers―Three Years After Intervention―African American / Black, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for African American/Black and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.13.1

#### *Hispanic/Latino Students, Any (ELA, Math, or Science) AP Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam  Takers―Three Years After Intervention―Hispanic/Latino, by  Percent of Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

**Figure C.13.2**

*Hispanic/Latino Students, AP Science Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Takers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam takers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Exam Takers―Three Years After Intervention―Hispanic/Latino, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.14.1

#### *Hispanic Latino Students, Any (ELA, Math, or Science) AP Exam Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―Hispanic/Latino, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for Hispanic/Latino and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.14.2

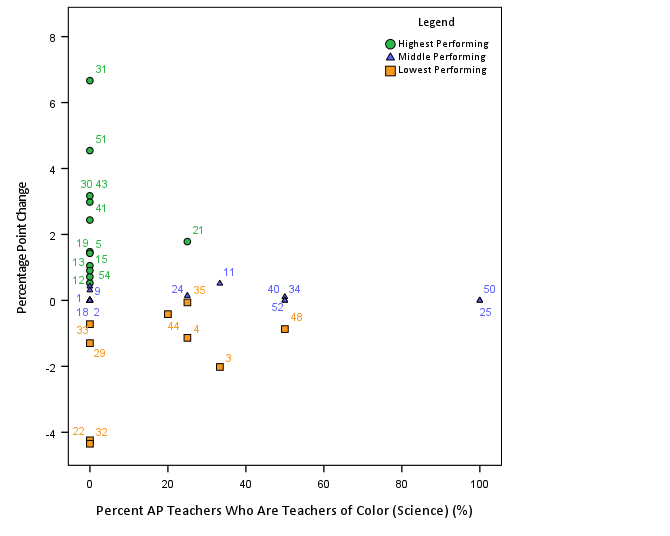
|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Passers―Three  Years After Intervention―Hispanic/Latino, by Percent of  Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Passers―Three Years After Intervention―Hispanic/Latino, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam passers on Y-axis for Hispanic/Latino and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

#### *Hispanic/Latino Students, AP Science Exam Passing*

C - Change in Percent of AP Science Exam Passers―Three Years After

Intervention―Hispanic/Latino, by Percent of Teachers who are

Teachers of Color



#### Figure C.15.1

#### *English Language Learners (EL), Any (ELA, Math, or Science) AP Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam  Takers―Three Years After Intervention―English Language Learners,  by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam takers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.15.2

#### *English Language Learners (EL), AP Science Exam Taking*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Takers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam takers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Exam Takers―Three Years After Intervention―English Language Learners, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam takers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.16.1

#### *English Language Learners (EL), Any (ELA, Math, or Science) AP Exam Passing*

|  |  |
| --- | --- |
| A – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of any AP exam passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of Any (ELA, Math, or Science) AP Exam Passers―Three Years After Intervention―English Language Learners, by  Percent of Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of any AP exam passers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### Figure C.16.2

#### *English Language Learners (EL), AP Science Exam Passing*

|  |  |
| --- | --- |
| A – Change in Percent of AP Science Exam Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI | B – Change in Percent of AP Science Exam Passers―Three Years After Intervention―English Language Learners, by Percent of Teachers Attending One or More APSI and Retained |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI on the x-axis, three years after intervention. | Scatterplot showing percentage point change of AP science exam passers on Y-axis for English Language Learners and percent of teachers attending one or more APSI and retained on the x-axis, three years after intervention. |

|  |  |
| --- | --- |
| C – Change in Percent of AP Science Exam Passers―Three Years After Intervention―English Language Learners, by Percent of AP Teachers who are Teachers of Color |  |
| Scatterplot showing percentage point change of AP science exam passers on Y-axis for English Language Learners and percent of teachers who are teachers of color on the x-axis, three years after intervention. |  |

#### [Appendix D:](#_Appendix_B:_Assessing) Number and Percent of Characteristics by School

Appendix D summarizes the number and percent of each characteristic of interest for schools included in the Year 10 analyses. Each table presents the schools ordered alphabetically within Cohort and shows details of each characteristic by number and percent.

[Table D.1. Number and Percent of Teachers Attended APSI Trainings, by Cohort, School and AP Subject](#_Table_D.1)

[Table D.2. Number and Percent of Teachers Attended APSI Trainings and Retained Three Years After the Last Year of Core, by Cohort, School and AP Subject](#_Table_D.2)

[Table D.3. Number and Percent of AP Teachers Who Are Teachers of Color, by Cohort, School and AP Subject](#_Table_D.3)

#### Table D.1

*Number and Percent of Teachers Attended APSI Trainings, by Cohort, School and AP Subject*

| **Cohort** | **School Name** | **AP Subject** | **APSI Trainings Attended** | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **One** | **Two** | **Three or More** | **Any** |
|  |
| **5** | **Auburn Senior High** | Any (ELA, Math, or Science) | 14% (5) | 11% (4) | 0% (0) | 25% (9) |  |
|  |
| Science | 18% (2) | 27% (3) | 0% (0) | 45% (5) |  |
|  |
| **Barnstable High** | Any (ELA, Math, or Science) | 3% (2) | 11% (8) | 0% (0) | 14% (10) |  |
|  |
| Science | 10% (2) | 27% (4) | 0% (0) | 30% (6) |  |
|  |
| **Chicopee High** | Any (ELA, Math, or Science) | 4% (2) | 16% (8) | 2% (1) | 22% (11) |  |
|  |
| Science | 0% (0) | 27% (2) | 5% (1) | 16% (3) |  |
|  |
| **Claremont Academy** | Any (ELA, Math, or Science) | 0% (0) | 18% (3) | 0% (0) | 18% (3) |  |
|  |
| Science | 0% (0) | 25% (1) | 0% (0) | 25% (1) |  |
|  |
| **Drury High** | Any (ELA, Math, or Science) | 7% (2) | 20% (6) | 0% (0) | 27% (8) |  |
|  |
| Science | 8% (1) | 8% (1) | 0% (0) | 17% (2) |  |
|  |
| **Fitchburg High** | Any (ELA, Math, or Science) | 12% (6) | 2% (1) | 0% (0) | 13% (7) |  |
|  |
| Science | 18% (3) | 0% (0) | 0% (0) | 18% (3) |  |
|  |
| **Gardner High** | Any (ELA, Math, or Science) | 38% (8) | 14% (3) | 0% (0) | 52% (11) |  |
|  |
| Science | 33% (2) | 27% (1) | 0% (0) | 50% (3) |  |
|  |
| **Lee Middle/High School** | Any (ELA, Math, or Science) | 16% (3) | 16% (3) | 5% (1) | 37% (7) |  |
|  |
| Science | 20% (1) | 0% (0) | 20% (1) | 40% (2) |  |
|  |
| **Leicester High** | Any (ELA, Math, or Science) | 21% (5) | 17% (4) | 0% (0) | 38% (9) |  |
|  |
| Science | 67% (4) | 0% (0) | 0% (0) | 67% (4) |  |
|  |
| **Ludlow Senior High** | Any (ELA, Math, or Science) | 2% (1) | 16% (8) | 0% (0) | 18% (9) |  |
|  |
| Science | 5% (1) | 16% (3) | 0% (0) | 21% (4) |  |
|  |
| **Whitman Hanson Regional** | Any (ELA, Math, or Science) | 0% (0) | 18% (18) | 0% (0) | 18% (8) |  |
|  |
| Science | 0% (0) | 31% (4) | 0% (0) | 31% (4) |  |
|  |
| **6** | **Bartlett Jr Sr High School** | Any (ELA, Math, or Science) | 20% (5) | 12% (3) | 0% (0) | 32% (8) |  |
|  |
| Science | 13% (1) | 25% (2) | 0% (0) | 38% (3) |  |
|  |
| **Boston Green Academy** | Any (ELA, Math, or Science) | 12% (3) | 0% (0) | 0% (0) | 12% (3) |  |
|  |
| Science | 50% (3) | 0% (0) | 0% (0) | 50% (3) |  |
|  |
| **Chicopee Comprehensive High School** | Any (ELA, Math, or Science) | 10% (6) | 10% (6) | 0% (0) | 20% (12) |  |
|  |
| Science | 11% (2) | 0% (0) | 0% (0) | 11% (2) |  |
|  |
| **Excel High School** | Any (ELA, Math, or Science) | 11% (3) | 4% (1) | 0% (0) | 15% (4) |  |
|  |
| Science | 0% (0) | 0% (0) | 0% (0) | 0% (0) |  |
|  |
| **Holyoke High** | Any (ELA, Math, or Science) | 7% (4) | 3% (2) | 0% (0) | 10% (6) |  |
|  |
| Science | 13% (2) | 6% (1) | 0% (0) | 19% (3) |  |
|  |
| **Jeremiah E Burke High** | Any (ELA, Math, or Science) | 18% (4) | 5% (1) | 0% (0) | 23% (5) |  |
|  |
| Science | 17% (1) | 17% (1) | 0% | 33% (2) |  |
|  |
|  |
| **New Bedford High** | Any (ELA, Math, or Science) | 12% (12) | 3% (3) | 0% (0) | 15% (15) |  |
|  |
| Science | 11% (3) | 7% (2) | 0% (0) | 19% (5) |  |
|  |
| **North Brookfield High** | Any (ELA, Math, or Science) | 20% (2) | 20% (2) | 0% (0) | 40% (4) |  |
|  |
| Science | 25% (1) | 0% (0) | 0% (0) | 25% (1) |  |
|  |
| **Shepherd Hill Regional High** | Any (ELA, Math, or Science) | 12% (5) | 12% (5) | 7% (3) | 30% (13) |  |
|  |
| Science | 0% (0) | 23% (3) | 8% (1) | 31% (4) |  |
|  |
| **Taconic High** | Any (ELA, Math, or Science) | 18% (7) | 18% (7) | 0% (0) | 37% (14) |  |
|  |
| Science | 18% (3) | 18% (3) | 0% (0) | 35% (6) |  |
|  |
| **Tantasqua Regional Sr High** | Any (ELA, Math, or Science) | 12% (6) | 8% (4) | 2% (1) | 21% (11) |  |
|  |
| Science | 21% (3) | 0% (0) | 0% (0) | 21% (3) |  |
|  |
| **Wareham Senior High** | Any (ELA, Math, or Science) | 18% (7) | 0% (0) | 0% (0) | 18% (7) |  |
|  |
| Science | 17% (2) | 0% (0) | 0% (0) | 17% (2) |  |
|  |
| **7** | **Bay Path Regional Vocational Technical High School** | Any (ELA, Math, or Science) | 9% (4) | 2% (1) | 0% (0) | 11% (5) |  |
|  |
| Science | 0% (1) | 8% (1) | 8% (0) | 15% (2) |  |
|  |
| **Bourne High School** | Any (ELA, Math, or Science) | 5% (1) | 14% (3) | 9% (2) | 27% (6) |  |
|  |
| Science | 0% (0) | 29% (2) | 0% (0) | 29% (2) |  |
|  |
| **Charlestown High** | Any (ELA, Math, or Science) | 13% (7) | 2% (1) | 0% (0) | 15% (8) |  |
|  |
| Science | 25% (4) | 0% (0) | 0% (0) | 25% (4) |  |
|  |
| **Granby Jr Sr High School** | Any (ELA, Math, or Science) | 7% (1) | 21% (3) | 0% (0) | 29% (4) |  |
|  |
| Science | 33% (1) | 0% (0) | 0% (0) | 33% (1) |  |
|  |
|  |
| **Melrose High** | Any (ELA, Math, or Science) | 30% (11) | 27% (10) | 8% (3) | 65% (24) |  |
|  |
| Science | 23% (3) | 31% (4) | 8% (1) | 62% (8) |  |
|  |
| **Nantucket High** | Any (ELA, Math, or Science) | 29% (8) | 7% (2) | 0% (0) | 36% (10) |  |
|  |
| Science | 50% (5) | 0% (0) | 0% (0) | 50% (5) |  |
|  |
| **Oxford High** | Any (ELA, Math, or Science) | 48% (10) | 5% (1) | 0% (0) | 52% (11) |  |
|  |
| Science | 57% (4) | 0% (0) | 0% (0) | 57% (4) |  |
|  |
| **Pittsfield High** | Any (ELA, Math, or Science) | 13% (6) | 7% (3) | 2% (1) | 22% (10) |  |
|  |
| Science | 10% (2) | 5% (1) | 0% (0) | 15% (3) |  |
|  |
| **Roger L. Putnam Vocational Technical Academy** | Any (ELA, Math, or Science) | 17% (11) | 6% (4) | 0% (0) | 23% (15) |  |
|  |
| Science | 12% (2) | 6% (1) | 0% (0) | 18% (3) |  |
|  |
| **Saugus High** | Any (ELA, Math, or Science) | 40% (12) | 13% (4) | 3% (1) | 57% (17) |  |
|  |
| Science | 45% (5) | 0% (0) | 0% (0) | 45% (5) |  |
|  |
| **Sutton High School** | Any (ELA, Math, or Science) | 33% (7) | 10% (2) | 0% (0) | 43% (9) |  |
|  |
| Science | 29% (2) | 14% (1) | 0% (0) | 43% (3) |  |
|  |
| **Westfield High** | Any (ELA, Math, or Science) | 15% (8) | 13% (7) | 2% (1) | 30% (16) |  |
|  |
| Science | 20% (4) | 0% (0) | 0% (0) | 20% (4) |  |
|  |
|  |
| **8** | **Blackstone-Millville Regional High School** | Any (ELA, Math, or Science) | 41% (9) | 0% (0) | 0% (0) | 41% (9) |  |
|  |
| Science | 57% (4) | 0% (0) | 0% (0) | 57% (4) |  |
|  |
| **Carver Middle/High School** | Any (ELA, Math, or Science) | 29% (6) | 0% (0) | 0% (0) | 29% (6) |  |
|  |
| Science | 43% (3) | 0% (0) | 0% (0) | 43% (3) |  |
|  |
| **David Prouty High** | Any (ELA, Math, or Science) | 19% (3) | 19% (3) | 6% (1) | 44% (7) |  |
|  |
| Science | 20% (1) | 40% (2) | 0% (0) | 60% (3) |  |
|  |
| **Franklin County Technical** | Any (ELA, Math, or Science) | 5% (1) | 20% (4) | 6% (0) | 25% (5) |  |
|  |
| Science | 0% (0) | 0% (0) | 0% (0) | 0% (0) |  |
|  |
| **Joseph Case High** | Any (ELA, Math, or Science) | 27% (8) | 17% (5) | 3% (1) | 47% (14) |  |
|  |
| Science | 40% (4) | 20% (2) | 0% (0) | 60% (6) |  |
|  |
| **Millbury Junior/Senior High** | Any (ELA, Math, or Science) | 21% (6) | 10% (3) | 0% (0) | 31% (9) |  |
|  |
| Science | 11% (1) | 11% (1) | 0% (0) | 22% (2) |  |
|  |
| **Nashoba Valley Technical High School** | Any (ELA, Math, or Science) | 13% (3) | 13% (3) | 0% (0) | 25% (6) |  |
|  |
| Science | 50% (3) | 17% (1) | 0% (0) | 67% (4) |  |
|  |
| **Seekonk High** | Any (ELA, Math, or Science) | 19% (5) | 11% (3) | 0% (0) | 30% (8) |  |
|  |
| Science | 25% (2) | 13% (1) | 0% (0) | 38% (3) |  |
|  |
| **Somerville High** | Any (ELA, Math, or Science) | 15% (9) | 2% (1) | 2% (1) | 18% (11) |  |
|  |
| Science | 27% (4) | 0% (0) | 0% (0) | 27% (4) |  |
|  |
| **9** | **Avon Middle High School** | Any (ELA, Math, or Science) | 6% (1) | 28% (5) | 6% (0) | 33% (6) |  |
|  |
| Science | 0% (0) | 50% (2) | 0% (0) | 50% (2) |  |
|  |
| **Ayer Shirley Regional High School** | Any (ELA, Math, or Science) | 28% (7) | 8% (2) | 0% (0) | 36% (9) |  |
|  |
| Science | 33% (2) | 0% (0) | 0% (0) | 33% (2) |  |
|  |
| **Grafton High School** | Any (ELA, Math, or Science) | 15% (6) | 2% (1) | 0% (0) | 17% (7) |  |
|  |
| Science | 17% (2) | 0% (0) | 0% (0) | 17% (2) |  |
|  |
| **Joseph P Keefe Technical High School** | Any (ELA, Math, or Science | 8% (2) | 8% (2) | 0% (0) | 15% (4) |  |
|  |
| Science | 14% (1) | 0% (0) | 0% (0) | 14% (1) |  |
|  |
| **Pathfinder Vocational Technical** | Any (ELA, Math, or Science) | 12% (2) | 4% (2) | 4% (0) | 19% (4) |  |
|  |
| Science | 0% (0) | 0% (0) | 0% (0) | 0% (0) |  |
|  |
| **TechBoston Academy** | Any (ELA, Math, or Science) | 6% (2) | 3% (1) | 0% (0) | 9% (3) |  |
|  |
| Science | 0% (0) | 14% (1) | 0% (0) | 14% (1) |  |
|  |
| **Tri-County Regional Vocational Technical** | Any (ELA, Math, or Science) | 5% (2) | 12% (5) | 0% (0) | 16% (7) |  |
|  |
| Science | 0% (0) | 10% (1) | 0% (0) | 10% (1) |  |
|  |
| **Urban Science Academy** | Any (ELA, Math, or Science) | 5% (2) | 3% (1) | 0% (0) | 8% (3) |  |
|  |
| Science | 0% (0) | 11% (1) | 0% (0) | 11% (1) |  |
|  |
| **West Roxbury Academy** | Any (ELA, Math, or Science) | 11% (3) | 0% (0) | 0% (0) | 11% (3) |  |
|  |
| Science | 33% (1) | 0% (0) | 0% (0) | 33% (1) |  |
|  |

#### Table D.2

*Number and Percent of Teachers Attended APSI Trainings and Retained Three Years After the Last Year of Core, by Cohort, School and AP Subject*

| **Cohort** | **School Name** | **AP Subject** | **APSI Trainings Attended and Retained Three Year After the Last Year of Core** | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **One** | **Two** | **Three or More** | **Any** |
|  |
| **5** | **Auburn Senior High** | Any (ELA, Math, or Science) | 80% (4) | 75% (3) | - | 78% (7) |  |
|  |
| Science | 50% (1) | 67% (2) | - | 60% (3) |  |
|  |
| **Barnstable High** | Any (ELA, Math, or Science) | 100% (2) | 100% (8) | - | 100% (10) |  |
|  |
| Science | 100% (2) | 100% (4) | - | 100% (6) |  |
|  |
| **Chicopee High** | Any (ELA, Math, or Science) | 50% (1) | 63% (5) | 100% (1) | 64% (7) |  |
|  |
| Science | - | 100% (2) | 100% (1) | 100% (3) |  |
|  |
| **Claremont Academy** | Any (ELA, Math, or Science) | - | 100% (3) | - | 100% (3) |  |
|  |
| Science | - | 100% (1) | - | 100% (1) |  |
|  |
| **Drury High** | Any (ELA, Math, or Science | 50% (1) | 50% (3) | - | 50% (4) |  |
|  |
| Science | 100% (1) | 100% (1) | - | 100% (2) |  |
|  |
| **Fitchburg High** | Any (ELA, Math, or Science) | 67% (4) | 100% (1) | - | 71% (5) |  |
|  |
| Science | 100% (3) | - | - | 100% (3) |  |
|  |
| **Gardner High** | Any (ELA, Math, or Science) | 50% (4) | 33% (1) | - | 45% (5) |  |
|  |
| Science | 50% (1) | 100% (1) | - | 67% (2) |  |
|  |
| **Lee Middle/High School** | Any (ELA, Math, or Science) | 67% (2) | 100% (3) | 100% (1) | 86% (6) |  |
|  |
| Science | 100% (1) | - | 100% (1) | 100% (2) |  |
|  |
| **Leicester High** | Any (ELA, Math, or Science) | 60% (3) | 100% (4) | - | 78% (7) |  |
|  |
| Science | 75% (3) | - | - | 75% (3) |  |
|  |
| **Ludlow Senior High** | Any (ELA, Math, or Science) | 0% (0) | 100% (8) | - | 89% (8) |  |
|  |
| Science | 0% (0) | 100% (3) | - | 75% (3) |  |
|  |
| **Whitman Hanson Regional** | Any (ELA, Math, or Science | - | 100% (8) | - | 100% (8) |  |
|  |
| Science | - | 100% (4) | - | 100% (4) |  |
|  |
| **6** | **Bartlett Jr Sr High School** | Any (ELA, Math, or Science) | 100% (5) | 33% (1) | - | 75% (6) |  |
|  |
| Science | 100% (1) | 0% (0) | - | 33% (1) |  |
|  |
| **Boston Green Academy** | Any (ELA, Math, or Science) | 33% (1) | 0% (0) | - | 33% (1) |  |
|  |
| Science | 33% (1) | - | - | 33% (1) |  |
|  |
| **Chicopee Comprehensive High School** | Any (ELA, Math, or Science) | 100% (6) | 33% (2) | - | 67% (8) |  |
|  |
| Science | 100% (2) | - | - | 100% (2) |  |
|  |
| **Excel High School** | Any (ELA, Math, or Science) | 33% (1) | 0% (0) | - | 25% (1) |  |
|  |
| Science | - | - | - | - |  |
|  |
| **Holyoke High** | Any (ELA, Math, or Science) | 25% (1) | 0% (0) | - | 17% (1) |  |
|  |
| Science | 50% (1) | 0% (0) | - | 33% (1) |  |
|  |
| **Jeremiah E Burke High** | Any (ELA, Math, or Science) | 50% (2) | 0% (0) | - | 40% (2) |  |
|  |
| Science | 0% (0) | 0% (0) | - | 0% (0) |  |
|  |
|  |
| **New Bedford High** | Any (ELA, Math, or Science) | 83% (10) | 33% (1) | - | 73% (11) |  |
|  |
| Science | 67% (2) | 0% (0) | - | 40% (2) |  |
|  |
| **North Brookfield High** | Any (ELA, Math, or Science | 50% (1) | 100% (2) | - | 75% (3) |  |
|  |
| Science | 0% (0) | - | - | 0% (0) |  |
|  |
| **Shepherd Hill Regional High** | Any (ELA, Math, or Science) | 60% (3) | 60% (3) | 100% (3) | 69% (9) |  |
|  |
| Science | 0% (0) | 67% (2) | 100% (1) | 75% (3) |  |
|  |
| **Taconic High** | Any (ELA, Math, or Science) | 71% (5) | 100% (7) | - | 86% (12) |  |
|  |
| Science | 67% (2) | 100% (3) | - | 83% (5) |  |
|  |
| **Tantasqua Regional Sr High** | Any (ELA, Math, or Science | 83% (5) | 75% (3) | 100% (1) | 82% (9) |  |
|  |
| Science | 100% (3) | - | - | 100% (3) |  |
|  |
| **Wareham Senior High** | Any (ELA, Math, or Science) | 57% (4) | - | - | 57% (4) |  |
|  |
| Science | 50% (1) | - | - | 50% (1) |  |
|  |
| **7** | **Bay Path Regional Vocational Technical High School** | Any (ELA, Math, or Science) | 75% (3) | 0% (0) | - | 60% (3) |  |
|  |
| Science | 0% (0) | 0% (0) | - | 0% (0) |  |
|  |
| **Bourne High School** | Any (ELA, Math, or Science | 100% (1) | 100% (3) | 50% (1) | 83% (5) |  |
|  |
| Science | - | 100% (2) | - | 100% (2) |  |
|  |
| **Charlestown High** | Any (ELA, Math, or Science) | 29% (2) | 0% (0) | - | 25% (2) |  |
|  |
| Science | 29% (2) | 0% (0) | - | 50% (2) |  |
|  |
| **Granby Jr Sr High School** | Any (ELA, Math, or Science) | 0% (0) | 100% (3) | - | 75% (3) |  |
|  |
| Science | 0% (0) | - | - | 0% (0) |  |
|  |
|  |
| **Melrose High** | Any (ELA, Math, or Science) | 64% (7) | 70% (7) | 100% (3) | 71% (17) |  |
|  |
| Science | 67% (2) | 75% (3) | 100% (1) | 75% (6) |  |
|  |
| **Nantucket High** | Any (ELA, Math, or Science) | 50% (4) | 50% (1) | - | 50% (5) |  |
|  |
| Science | 40% (2) | - | - | 40% (2) |  |
|  |
| **Oxford High** | Any (ELA, Math, or Science) | 50% (5) | 100% (1) | - | 55% (6) |  |
|  |
| Science | 50% (2) | - | - | 50% (2) |  |
|  |
| **Pittsfield High** | Any (ELA, Math, or Science | 50% (3) | 67% (2) | 0% | 50% (5) |  |
|  |
| Science | 50% (1) | 0% (0) | - | 33% (1) |  |
|  |
| **Roger L. Putnam Vocational Technical Academy** | Any (ELA, Math, or Science) | 64% (7) | 50% (2) | - | 60% (9) |  |
|  |
| Science | 0% (0) | 0% (0) | - | 0% (0) |  |
|  |
| **Saugus High** | Any (ELA, Math, or Science) | 67% (8) | 100% (4) | 100% (1) | 76% (13) |  |
|  |
| Science | 60% (3) | - | - | 60% (3) |  |
|  |
| **Sutton High School** | Any (ELA, Math, or Science) | 71% (5) | 100% (2) | - | 78% (7) |  |
|  |
| Science | 50% (1) | 100% (1) | - | 67% (2) |  |
|  |
| **Westfield High** | Any (ELA, Math, or Science) | 75% (6) | 100% (7) | 100% (1) | 88% (14) |  |
|  |
| Science | 100% (4) | - | - | 100% (4) |  |
|  |
|  |
| **8** | **Blackstone-Millville Regional High School** | Any (ELA, Math, or Science) | 44% (4) | 0% (0) | - | 44% (4) |  |
|  |
| Science | 50% (2) | - | - | 50% (2) |  |
|  |
| **Carver Middle/High School** | Any (ELA, Math, or Science) | 83% (5) | 0% (0) | - | 83% (5) |  |
|  |
| Science | 67% (2) | 0% (0) | - | 67% (2) |  |
|  |
| **David Prouty High** | Any (ELA, Math, or Science) | 100% (3) | 67% (2) | 100% (1) | 86% (6) |  |
|  |
| Science | 100% (1) | 50% (1) | - | 67% (2) |  |
|  |
| **Franklin County Technical** | Any (ELA, Math, or Science) | 100% (1) | 100% (4) | - | 100% (5) |  |
|  |
| Science | - | - | - | - |  |
|  |
| **Joseph Case High** | Any (ELA, Math, or Science) | 75% (6) | 60% (3) | 0% (0) | 64% (9) |  |
|  |
| Science | 50% (2) | 50% (1) | - | 50% (3) |  |
|  |
| **Millbury Junior/Senior High** | Any (ELA, Math, or Science | 67% (4) | 100% (3) | - | 78% (7) |  |
|  |
| Science | 0% (0) | 100% (1) | - | 50% (1) |  |
|  |
| **Nashoba Valley Technical High School** | Any (ELA, Math, or Science) | 67% (2) | 33% (1) | - | 50% (3) |  |
|  |
| Science | 67% (2) | 0% (0) | - | 50% (2) |  |
|  |
| **Seekonk High** | Any (ELA, Math, or Science) | 80% (4) | 100% (3) | - | 88% (7) |  |
|  |
| Science | 100% (2) | 100% (1) | - | 100% (3) |  |
|  |
| **Somerville High** | Any (ELA, Math, or Science) | 89% (8) | 100% (1) | 100% (1) | 91% (10) |  |
|  |
| Science | 75% (3) | - | - | 75% (3) |  |
|  |

#### Table D.3

*Number and Percent of AP Teachers Who Are Teachers of Color, by Cohort, School and AP Subject*

| **Cohort** | **School Name** | **AP Subject** | **AP Teachers of Color in Third Year of Core** |
| --- | --- | --- | --- |
|  |
|  |
| **5** | **Auburn Senior High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Barnstable High** | Any (ELA, Math, or Science) | 8% (1) |  |
|  |
| Science | 25% (1) |  |
|  |
| **Chicopee High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Claremont Academy** | Any (ELA, Math, or Science) | 25% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Drury High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Fitchburg High** | Any (ELA, Math, or Science) | 8% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Gardner High** | Any (ELA, Math, or Science) | 11% (1) |  |
|  |
| Science | 25% (1) |  |
|  |
| **Lee Middle/High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Leicester High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Ludlow Senior High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Whitman Hanson Regional** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| 6 | **Bartlett Jr Sr High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Boston Green Academy** | Any (ELA, Math, or Science) | 40% (2) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Chicopee Comprehensive High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Excel High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Holyoke High** | Any (ELA, Math, or Science) | 25% (2) |  |
|  |
| Science | 25% (1) |  |
|  |
| **Jeremiah E Burke High** | Any (ELA, Math, or Science) | 25% (1) |  |
|  |
| Science | 100% (1) |  |
|  |
|  |
| **New Bedford High** | Any (ELA, Math, or Science) | 31% (4) |  |
|  |
| Science | 25% (1) |  |
|  |
| **North Brookfield High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Shepherd Hill Regional High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Taconic High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Tantasqua Regional Sr High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Wareham Senior High** | Any (ELA, Math, or Science) | 17% (1) |  |
|  |
| Science | 50% (1) |  |
|  |
| 7 | **Bay Path Regional Vocational Technical High School** | Any (ELA, Math, or Science) | 20% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Bourne High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Charlestown High** | Any (ELA, Math, or Science) | 50% (3) |  |
|  |
| Science | 33% (1) |  |
|  |
| **Granby Jr Sr High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
|  |
| **Melrose High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Nantucket High** | Any (ELA, Math, or Science) | 17% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Oxford High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Pittsfield High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Roger L. Putnam Vocational Technical Academy** | Any (ELA, Math, or Science) | 25% (2) |  |
|  |
| Science | 50% (1) |  |
|  |
| **Saugus High** | Any (ELA, Math, or Science) | 10% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Sutton High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Westfield High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
|  |
| 8 | **Blackstone-Millville Regional High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Carver Middle/High School** | Any (ELA, Math, or Science) | 14% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **David Prouty High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Franklin County Technical** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Joseph Case High** | Any (ELA, Math, or Science) | 13% (1) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Millbury Junior/Senior High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Nashoba Valley Technical High School** | Any (ELA, Math, or Science) | 25% (1) |  |
|  |
| Science | 50% (1) |  |
|  |
| **Seekonk High** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Somerville High** | Any (ELA, Math, or Science) | 8% (1) |  |
|  |
| Science | 20% (1) |  |
|  |
| 9 | **Avon Middle High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Ayer Shirley Regional High School** | Any (ELA, Math, or Science) | 14% (1) |  |
|  |
| Science | 33% (1) |  |
|  |
| **Grafton High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Joseph P Keefe Technical High School** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Pathfinder Vocational Technical** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **TechBoston Academy** | Any (ELA, Math, or Science) | 20% (1) |  |
|  |
| Science | 50% (1) |  |
|  |
| **Tri-County Regional Vocational Technical** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |
| **Urban Science Academy** | Any (ELA, Math, or Science) | 67% (2) |  |
|  |
| Science | 100% (1) |  |
|  |
| **West Roxbury Academy** | Any (ELA, Math, or Science) | 0% (0) |  |
|  |
| Science | 0% (0) |  |
|  |

1. Analyses summarized in the Year 8 report were subject to limitations, and results should be interpreted with caution. Please see the Year 8 report for further details. [↑](#footnote-ref-2)
2. Year 8 key findings have been reordered to prioritize those most relevant to the current research questions, with a focus on students from historically marginalized communities. [↑](#footnote-ref-3)
3. Taking (or passing) one ELA, math, or science AP course was counted as taking (or passing) one AP course. [↑](#footnote-ref-4)
4. Year 8 key findings have been reordered to prioritize those most relevant to the current research questions, with a focus on students from historically marginalized communities. [↑](#footnote-ref-5)
5. Increasing participation and performance in English Language Arts (ELA) AP courses and AP exams is not a stated goal of the project. However, increasing participation and performance in ELA AP courses and exams is frequently reflected as a goal of the program in practice. [↑](#footnote-ref-6)
6. The Year 8 evaluation resulted in a total of five reports addressing AP course availability, AP course taking and passing (descriptive and analysis), and AP exam taking and passing (descriptive and analysis). [↑](#footnote-ref-7)
7. Data from the 2019–20 and 2020–21 school years were not included for two reasons: (1) Year 10 analysis is intended to be an extension of the Year 9 analysis which was restricted to SY11 to SY19, and (2) school years more current than SY19 overlapped with COVID and resulting alternate class delivery and learning solutions. As such, the data may not be comparable for this evaluation’s purposes. [↑](#footnote-ref-8)
8. To be considered a course taker, a student must have enrolled in one or more ELA, math, or science AP course. As the AP STEM and English program aims to increase the proportion of students enrolling in AP courses, the percentage of AP STEM and English course takers was calculated using the total number of students enrolled in 9th–12th grade at the school as the denominator—as opposed to using the total number of students enrolled in AP courses. [↑](#footnote-ref-9)
9. To be considered a course passer, a student must have (1) completed the course, (2) earned credit, and (3) received a passing letter or numeric grade within the course. [↑](#footnote-ref-10)
10. AP course passing rates are calculated based on the number of students enrolled in the school rather than the number of students enrolled in the AP course, since the objective of the analysis was to determine if the *overall rate of AP course passing* had changed more at participating schools than at similar non-participating schools, and not to determine if the *rate of passing among course takers* had changed more at participating schools than at similar non-participating schools. Similarly, AP exam passing rates are calculated based on the number of students enrolled in the school rather than the number of students taking the AP exam. [↑](#footnote-ref-11)
11. To be considered an exam passer, a student must have scored a three or better on at least one of their AP ELA, math, or science exams. [↑](#footnote-ref-12)
12. Percent teachers who attended at least one APSI training was calculated by taking the total number of teachers who attended at least one APSI training in a given AP content area during the school’s three years of core status, and then dividing that by the total number of teachers in a given AP content area during the third year of the school’s core status. [↑](#footnote-ref-13)
13. Percent teachers who attended at least one APSI training and were retained was calculated by taking the total number of teachers who attended at least one APSI training in a given AP content area during the school’s three years of core status *and* who were retained three years after the last year of the school’s core status, and then dividing that by the total number of teachers who had attended at least one APSI training in a given content area during the school’s three years of core status. [↑](#footnote-ref-14)
14. Percent AP teachers who are teachers of color was calculated by taking the total number of AP teachers who were teachers of color in a given AP content area during the school’s third year of core status, and then dividing that by the total number of all AP teachers in a given AP content area during the school’s third year of core status. [↑](#footnote-ref-15)
15. For reporting student information, a minimum *n* of 10 is required by DESE. See DESE (2022, November). *Researcher’s guide to Massachusetts state education data*, Office of Planning and Research, <https://www.doe.mass.edu/research/researchers-guide.docx>, p. 9. [↑](#footnote-ref-16)
16. Range refers to the range of the box-and-whiskers plots specifically and does not include the outliers. [↑](#footnote-ref-17)
17. Data has not been examined for the concurrence of non-urban schools, students who are white, and low percentages of AP teachers who are teachers of color. [↑](#footnote-ref-18)