

# Research Study: The Forgotten Middle

DINA BASSIRI

## Introduction

Today, college readiness is synonymous with career readiness. While not every high school graduate plans to attend college, the majority of the fastest-growing jobs that require a high school diploma, pay a salary above the poverty line for a family of four, and provide opportunities for career advancement all require knowledge and skills comparable to those expected of the first-year college student. ACT data show that fewer than two in 10 eighth graders are on target to be ready for college- and career-level work by the time they graduate from high school. This also means that more than eight of 10 eighth-grade students do not have the knowledge and skills they need to enter high school and succeed there.

This report examines the specific demographic and academic factors that influence college and career readiness. Our goals were to identify factors that are the most effective predictors of college and career readiness from middle school to high school and to examine the effect that academic preparation methods would have on students' degrees of readiness for college and career.

ACT studied the effectiveness of these factors using data from students who took ACT Explore® tests in eighth grade and the ACT® college readiness assessment in eleventh or twelfth grade. The outcome variables in the study were students' ACT scores in English, Mathematics, Reading, and Science. The predictor variables were students' background characteristics, their previous educational achievement (as measured by their ACT Explore scores), the high school they attended, their coursework, their grades, and variables related to the context in which they took the ACT.

## Data

This study uses data from students in the high school graduating class of 2013 who took ACT Explore in eighth grade in 2009. In the resulting analysis, we selected records with valid ACT Explore and ACT scores and records of high school students who took the ACT in eleventh or twelfth grade whose high school codes could be located in a file maintained

by Market Data Retrieval, Inc. The final data set contained records for 399,642 students at 6,228 high schools. This data set included 115,598 students who were members of racial/ethnic minority groups<sup>1</sup>. Table 1 presents demographic information for the sample used in the study.

**Table 1: Demographic Information for Research Study Sample**

Gender			
Female 53%		Male 47%	
Race/Ethnicity			
Caucasian American/White or Asian American 71%		Racial/ethnic minority 29%	
Geographic Region			
East 28%	Midwest 44%	Southwest 18%	West 10%
Annual Family Income			
≤\$36,000 30%	\$36,000–\$120,000 58%		>\$120,000 12%

## Method<sup>2</sup>

First, predictive models were constructed to examine the relative strengths of five classes of predictor variables (hereafter referred to as “factors”) in influencing students’ college and career readiness, as defined by their performance on the ACT<sup>3</sup>:

- **Background characteristics**—gender, race/ethnicity, parent educational level, annual family income, primary language spoken at home
- **Eighth-grade achievement**—ACT Explore scores in relevant subject areas
- **Standard coursework**—highest level of non-advanced, non-honors courses taken in relevant subject areas
- **High school grade point average**—self-reported grade average for courses taken in relevant subject areas
- **Student testing behaviors**—students’ age and grade level at time of taking the ACT, whether students retook the ACT, whether students provided updated coursework and grade information if retesting. Because student testing behaviors are the result of student decisions about whether, when, and how often to take the ACT, these behaviors reflect traits such as motivation and students’ self-perceptions about their academic abilities.

Next, we examined the impact of a variety of steps students could take to improve their college and career readiness during high school by comparing the percentage of all

<sup>1</sup> Racial/ethnic minority students were those who identified themselves as one of the following: African American, American Indian, Hispanic, or Multiracial.

<sup>2</sup> For detailed information about the study methodology, please see the ACT Research Report Series 2008-1.

<sup>3</sup> Because we anticipated that the predictive relationships might differ among high schools, we constructed hierarchical linear models in which regression weights relating predictor variables to outcome variables can vary among high schools.

students whose ACT scores would meet the ACT College Readiness Benchmarks<sup>4</sup> under various scenarios, including:

- Maintaining a B average in relevant standard high school courses
- Earning one letter grade higher in relevant standard high school courses
- Taking a core curriculum in relevant subject areas in high school<sup>5</sup>
- Taking additional standard courses in relevant subject areas in high school
- Meeting ACT Explore College Readiness Benchmarks<sup>6</sup> in all four subject areas
- Increasing ACT Explore scores two points in each subject area

Figures 1 through 4 show the additional percentages of students who would meet the ACT College Readiness Benchmarks in each subject area if the students took each of the seven steps independently of the others. Figures 5 through 8 showed similar results for racial/ethnic minority students.

## Conclusions

The purpose of this report was to revisit a study ACT conducted in 2008. From the analysis of the new data, we can conclude that the situation is essentially unchanged from the 2008 report results. Key takeaways from this study include:

- It is difficult for students to catch up from eighth to twelfth grades. This is a consequence of having little time, a long way to go, and overcoming barriers to learning. This difficulty in catching up seems to affect underrepresented minorities at higher rates, making it critically important to identify any learning deficiencies as early as possible.
- It will always be easier for a student to catch up if achievement gaps are identified at an earlier time point. Waiting until eighth grade may be too late for many students.
- Preparing students for college and career is a process that begins long before high school.
- K–8 standards must focus on the knowledge and skills that are essential for students to know, and these standards must be nonnegotiable for all students.
- Student progress must be monitored and interventions made earlier in middle school.
- Academic behaviors promote college readiness but are not substitutes for academic preparation.
- The focus of the discussion must change: the transition to high school is as important as the transition to college. Getting more eighth-grade students on track for college readiness must be an essential part of the high school reform agenda. ■

<sup>4</sup> The ACT College Readiness Benchmarks are the minimum ACT scores at which students are likely to succeed in beginning college-level courses at typical postsecondary institutions. The Benchmark scores are: English–18, Mathematics–22, Reading–22, and Science–23.

<sup>5</sup> The core curriculum in English was defined as English in grades 9–12; in mathematics, the core curriculum was defined as Algebra I, Geometry, and Algebra II; in reading, it was defined as any three courses in social studies; and in science, the core curriculum was defined as Biology and Chemistry.

<sup>6</sup> The ACT Explore Benchmark scores are the ACT Explore scores that students need to have a good chance of later meeting the ACT Benchmark scores. The ACT Explore Benchmark scores in grade 8 are: English–13, Mathematics–17, Reading–16, and Science–18.

## Increases in ACT College Readiness Benchmark Attainment Associated with Various Academic Interventions (All Students)

Figure 1: English

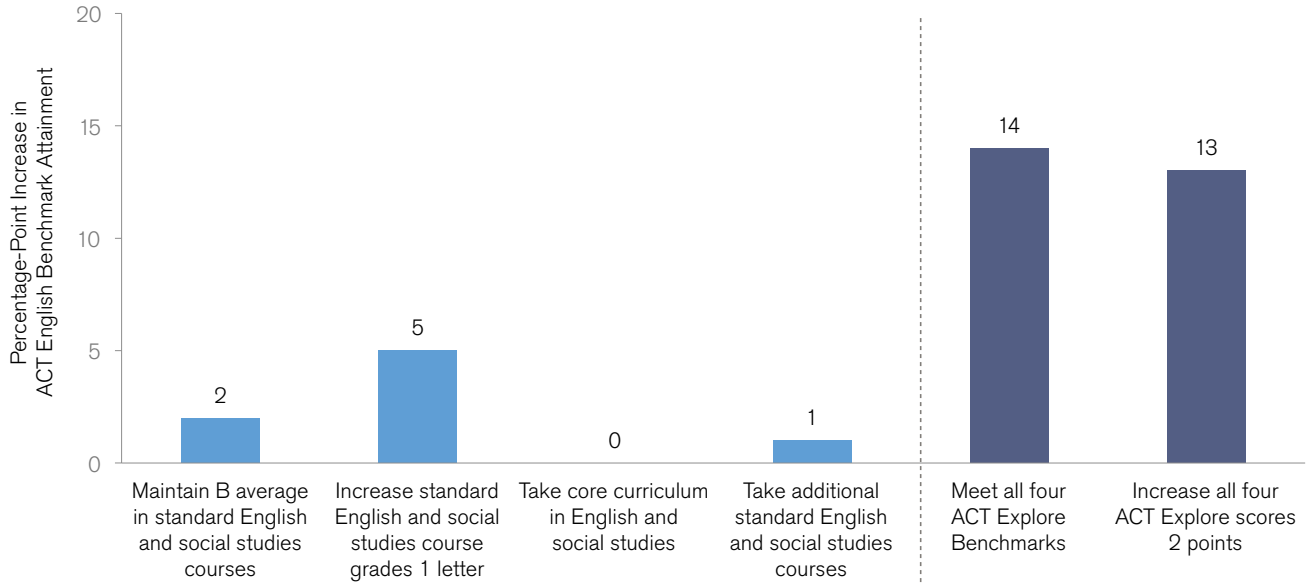


Figure 2: Mathematics

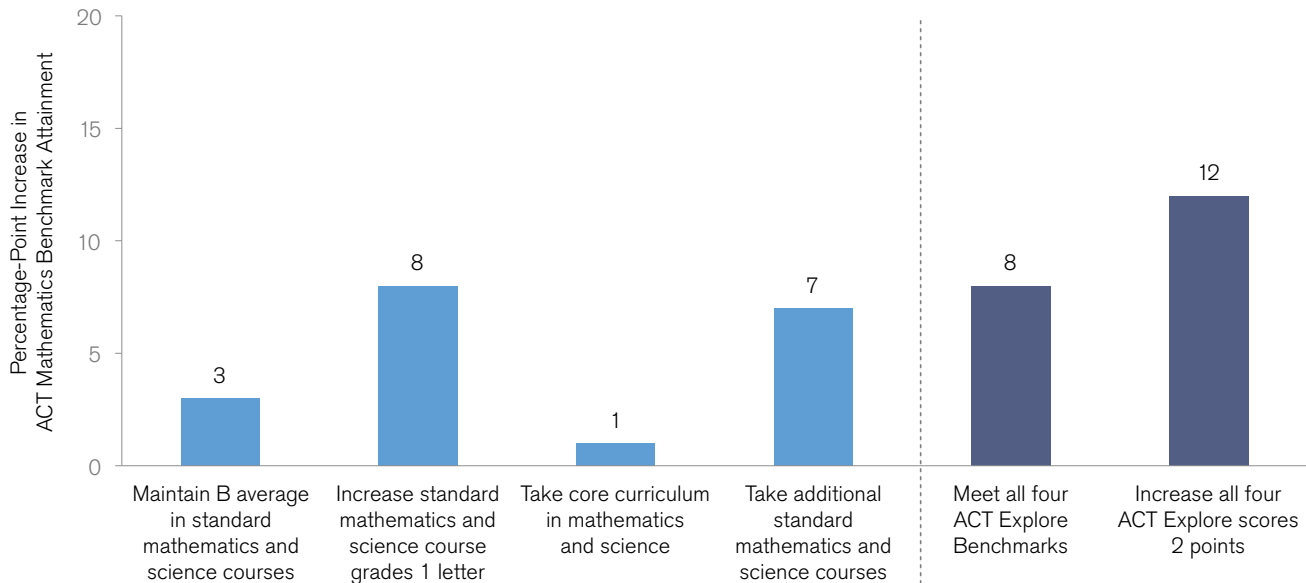


Figure 3: Reading

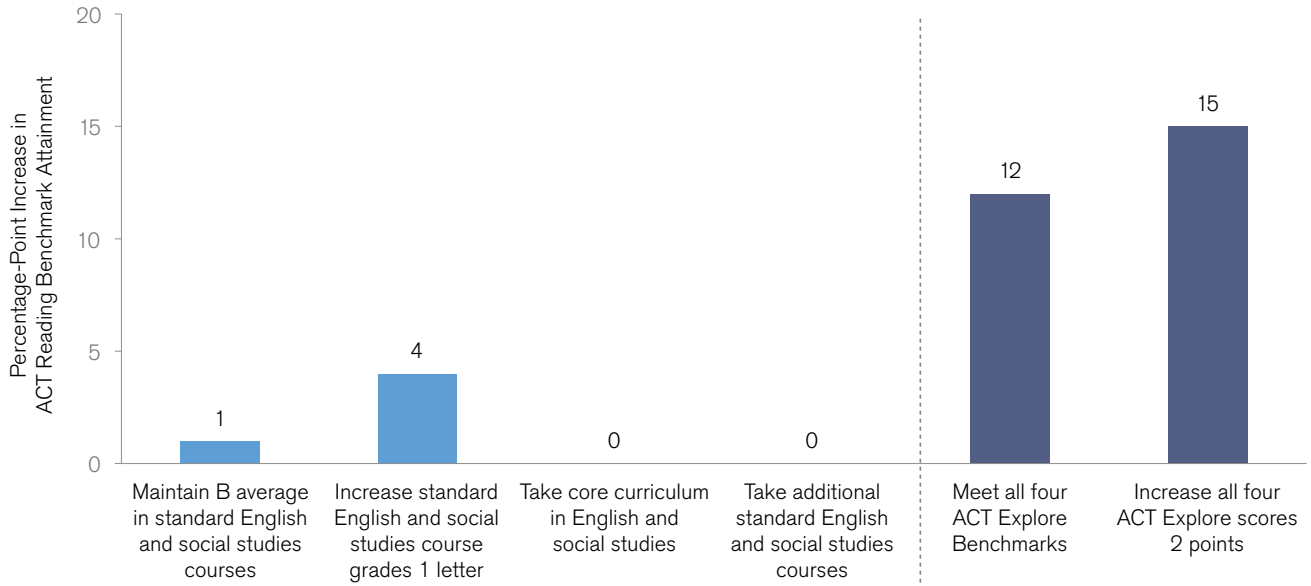
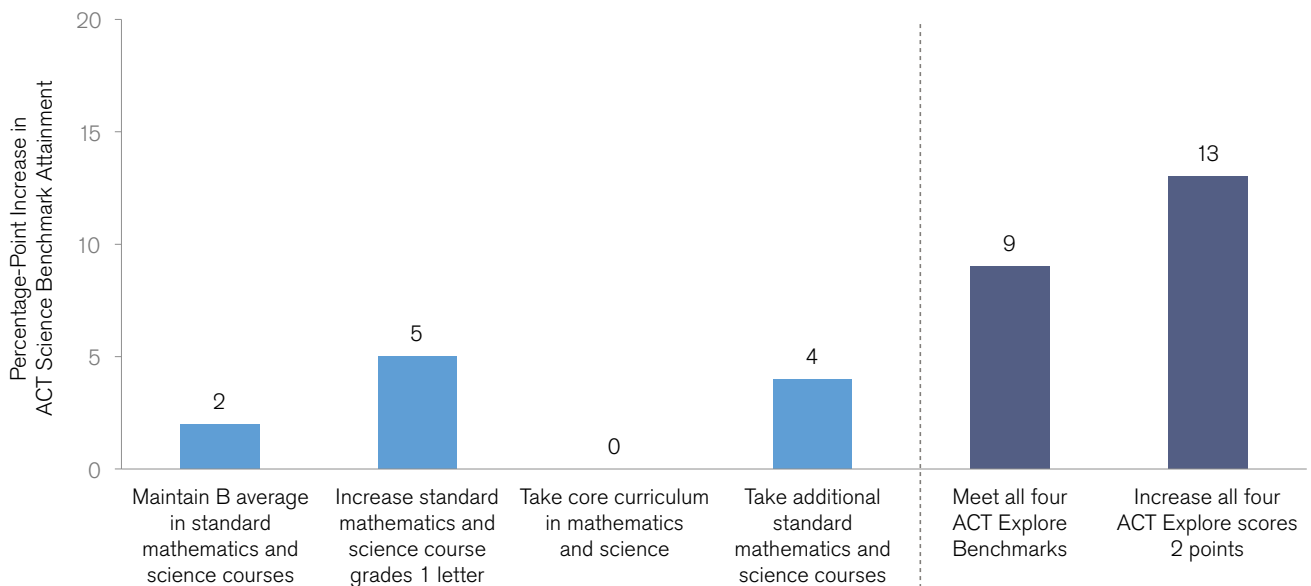


Figure 4: Science



## Increases in ACT College Readiness Benchmark Attainment Associated with Various Academic Interventions (Racial/Ethnic Minority Students)

Figure 5: English

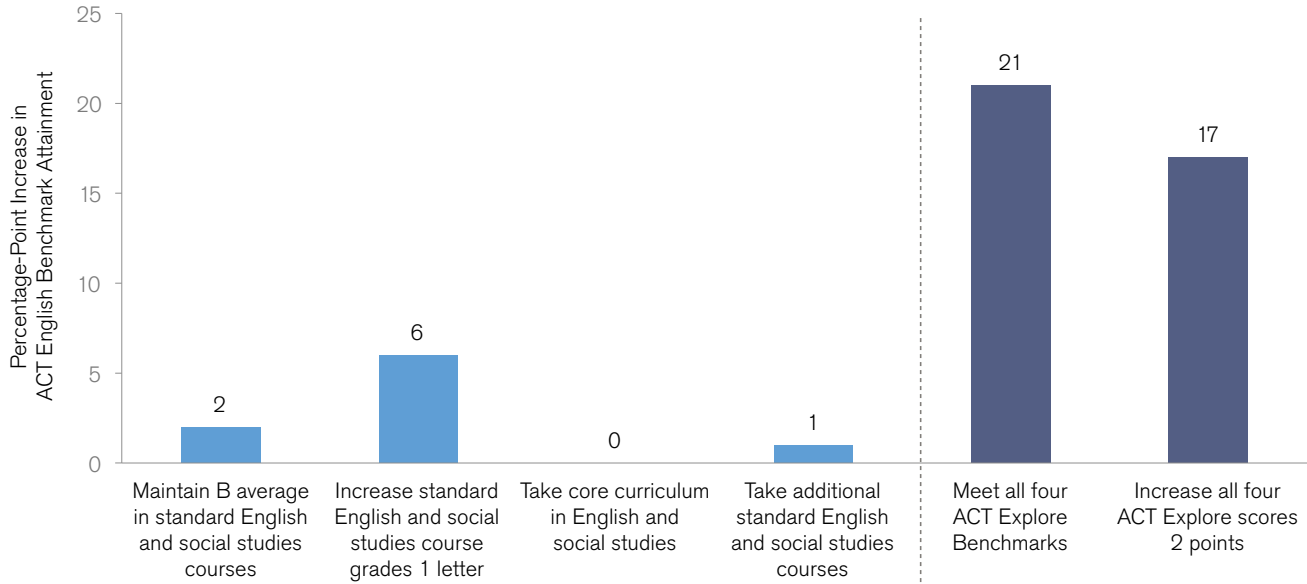


Figure 6: Mathematics

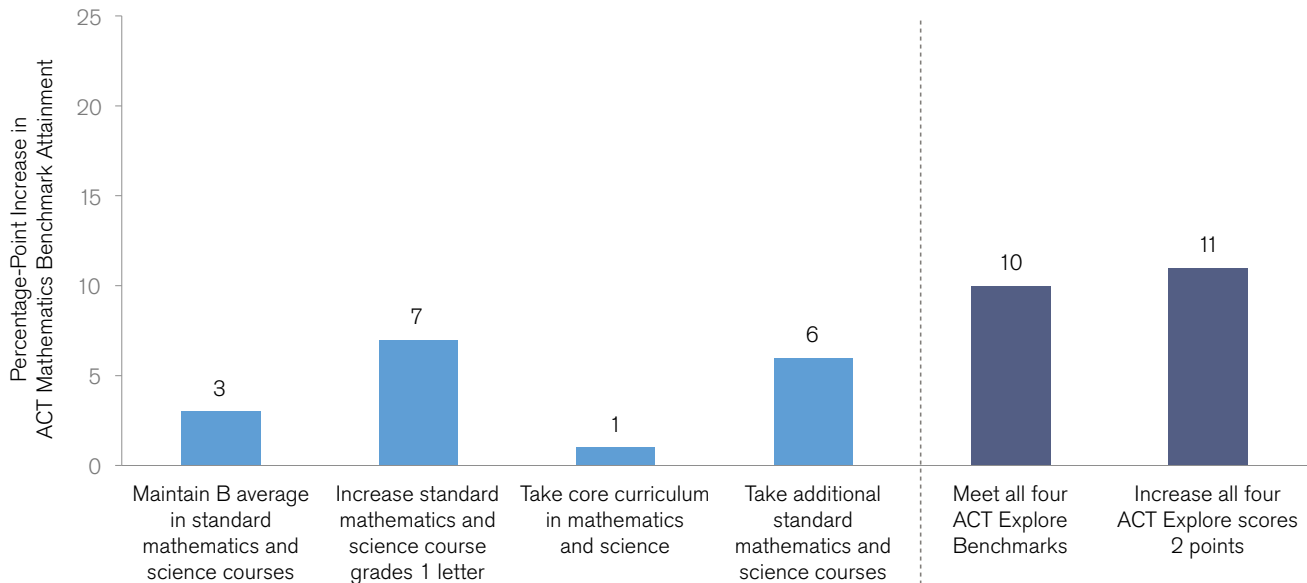


Figure 7: Reading

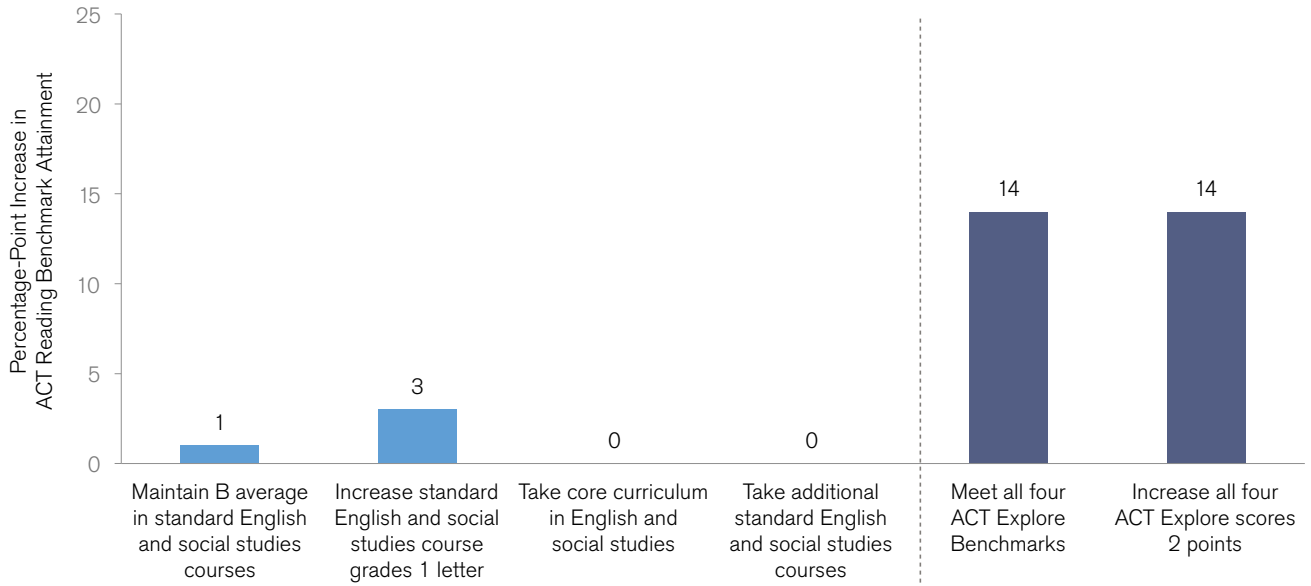
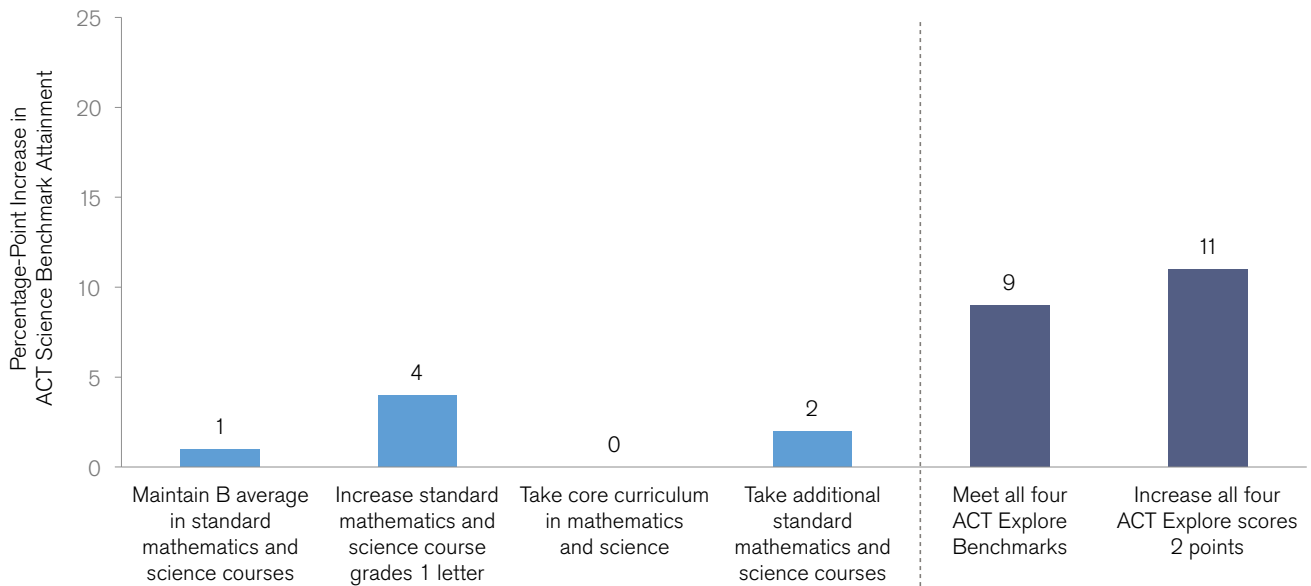


Figure 8: Science



**ACT<sup>®</sup>**



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