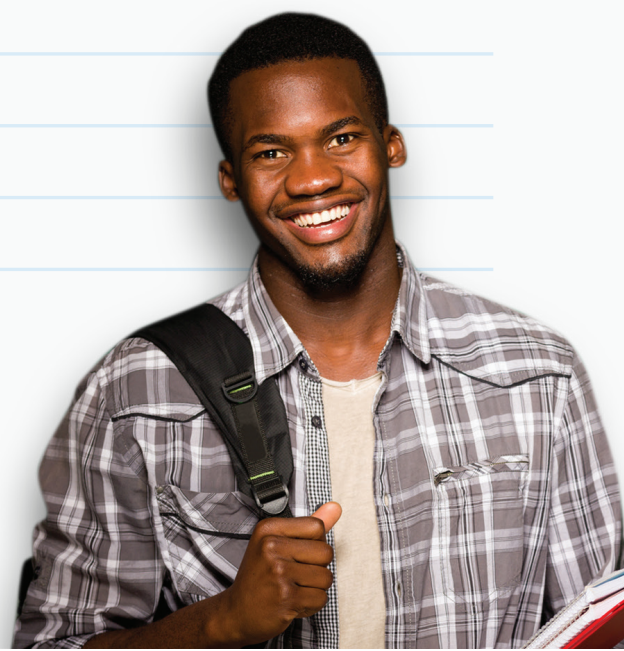
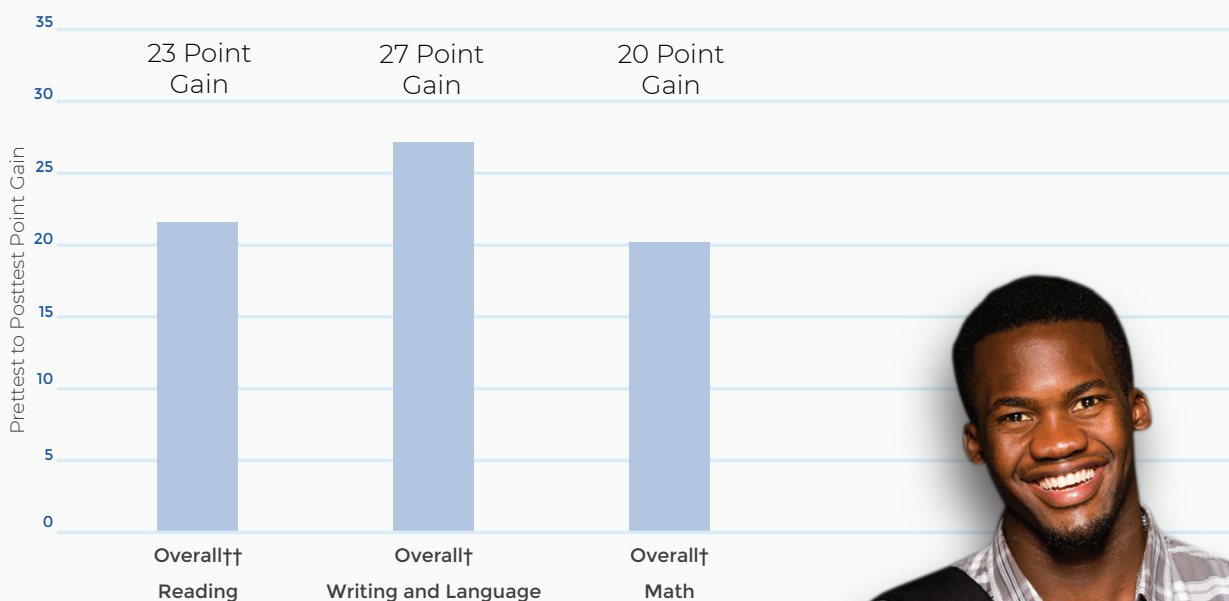




# Three Years of Gain: The Impact of Apex Learning SAT® Tutorials on Student Achievement

School Years 2016-2017 through 2018-2019

October 2019



## Introduction

The SAT® ensures students are ready for college-level coursework before they enroll in any college courses.

Apex Learning SAT® Tutorials provide instruction, practice, and assessment aligned to concepts assessed by the SAT® reading, writing and language, and math subject tests. Tutorials pretests and embedded formative assessments build an individualized course of study for each student that continually adapts to his or her unique learning needs. Students struggling with grade-level concepts are prescribed remedial instruction of skills down to the third-grade level as needed. Students build depth of knowledge, confidence, and higher order skills through instruction and practice of skills essential to the test.

Unit-level pretests and posttests provide granular performance data that links students' performance to SAT® strand descriptions and score ranges, quickly identifying where students have demonstrated content mastery and where they still need to focus their learning.

## Purpose of Study

The purpose of this study is to examine the impact of Apex Learning SAT® Tutorials on student learning over the course of three school years. The results of 26,643 modules with pretests, Test Its, and posttest scores across three school years were included in the analytical dataset. Tables showing Tutorials descriptive statistics and the results for all statistical tests are located in the appendix.

## Key Findings

*Apex Learning SAT® Tutorials significantly improved student performance on Tutorials posttest assessments across reading, writing and language, and mathematics for three straight years.*

Results of paired-samples t-tests (Table 2, appendix) suggested that SAT® Tutorials had a statistically significant impact on student gains from Tutorials pretest to posttest achievement for all school years by subject. Over all school years, the average gain for reading was 62%, writing and language at 63%, and math at 54%. The magnitude of the effect varied between moderate to large across subjects and school years.

Figures 1–3 illustrate the average pretest, posttest, and percentage point gain by subject and school year.

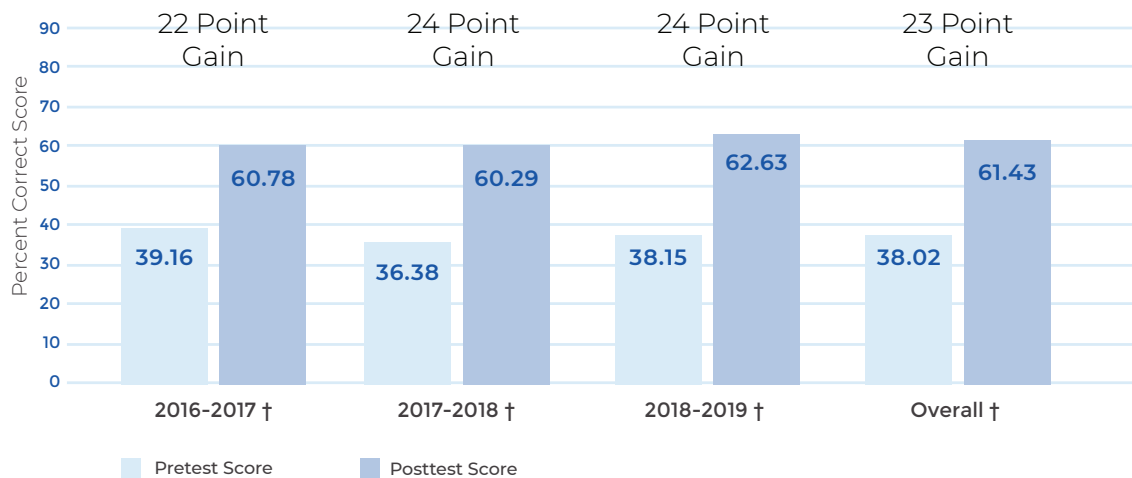
### SAT® Reading Tutorials

Following the use of SAT® Reading Tutorials:

- Tutorials gains from pretest and posttest score ranged from 22 to 24 points over three years. Relative to pretest performance, the gains are equal to a 55%, 66%, and 64% improvement for 2016-2017, 2017-2018, and 2018-2019 respectively. Over the three-year span, the average gain was 62%.
- The magnitude of the effect of Tutorials use on posttest achievement was large for all three school years ( $d=.80, .86, .85$  respectively).

Figure 1 shows the average pretest score, posttest score, and gain following use of SAT® English Tutorials.

**Figure 1**  
SAT® Reading: Average Pretest, Posttest, and Percentage Point Gain



†Differences between pre- and posttest for each school year are statistically significant. (Sig.  $p<.05$ ).  
Note: The number of modules included in the analysis by school year ranges from 2,094 to 3,392 and overall is 8,110.

### SAT® Writing and Language Tutorials

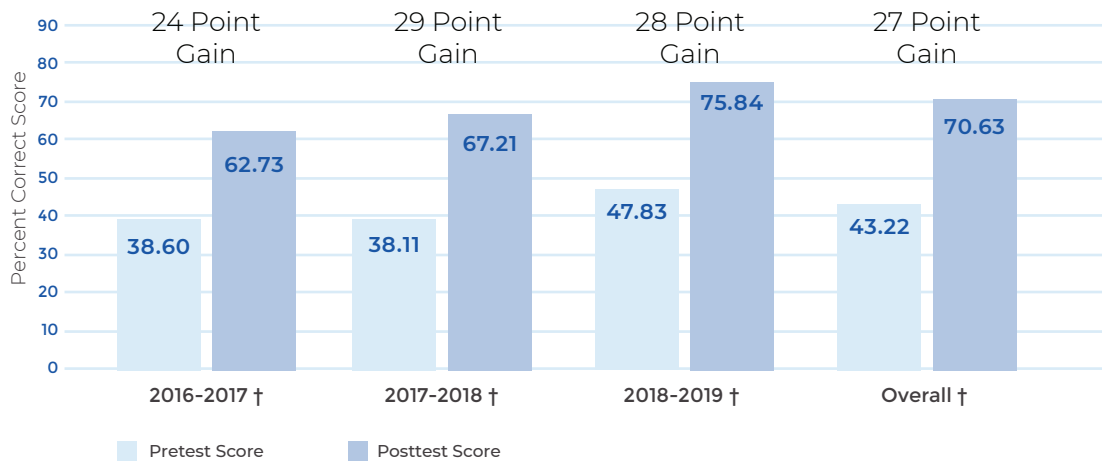
Following the use of SAT® Writing and Language Tutorials:

- Tutorials gains from pretest and posttest score ranged from 24 to 29 points over three years. Relative to pretest performance, the gains are equal to a 63%, 76%, and 59% improvement for 2016-2017, 2017-2018, and 2018-2019 respectively. Over the three-year span, the average gain was 63%.
- The magnitude of the effect of Tutorials use on posttest achievement was large over the three-year period ( $d=.84, 1.04, .90$  respectively).

Figure 2 shows average pretest and posttest achievement scores and gain following use of SAT® Writing and Language Tutorials.

**Figure 2**

SAT® Writing and Language: Average Pretest, Posttest, and Percentage Point Gain



†Differences between pre- and posttest for each school year are statistically significant. (Sig.  $p < .001$ ).

Note: The number of modules included in the analysis by school year ranges from 1,483 to 3,335 and overall is 6,484.

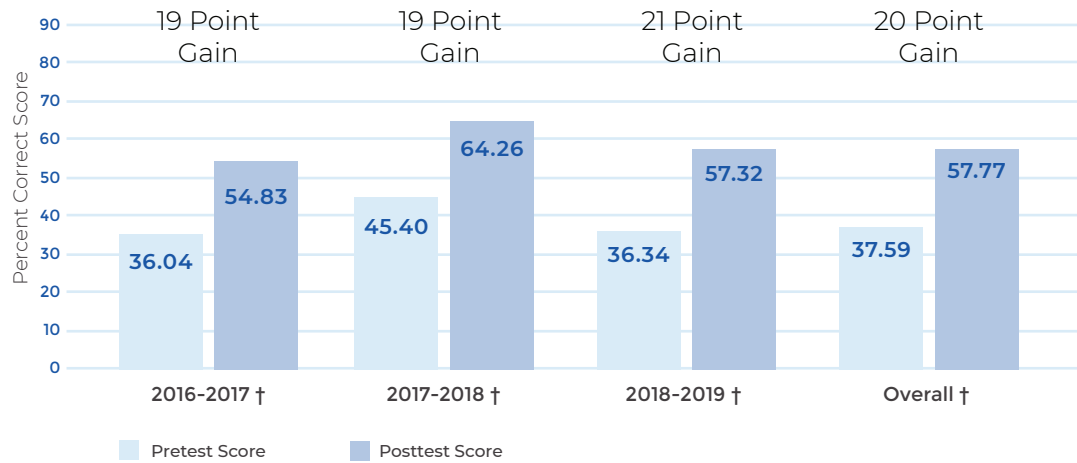
### SAT® Math Tutorials

Following the use of SAT® Math Tutorials:

- Tutorials gains from pretest and posttest score ranged from 19 to 21 points over three years. Relative to pretest performance, the gains are equal to a 52%, 42%, and 58% improvement for 2016-2017, 2017-2018, and 2018-2019, respectively. Over the three-year span, the average gain was 54%.
- The magnitude of the effect of Tutorials use on posttest achievement was large over the three-year period ( $d = .74, .69, .79$  respectively).

Figure 3 shows average pretest and posttest achievement scores and gain following use of SAT® Math Tutorials.

**Figure 3**  
SAT® Math: Average Pretest, Posttest, and Percentage Point Gain



†Differences between pre- and posttest for each school year are statistically significant. (Sig.  $p < .001$ ).  
Note: The number of modules included in the analysis by school year ranges from 1,743 to 7,636 and overall is 12,049.

## Study Description

### Study Design

A pretest/posttest single group design was used to evaluate the impact of Tutorials use on posttest performance.

### Participants

Participants included students from across the nation who used SAT® Tutorials. Student enrollments with completed unit pretests, 100% of unit modules, and unit posttests were included in analytical dataset.

### Data Preparation

Apex Learning provided 91,805 records of student level module data including enrollment ID number, subject, Tutorials name, unit name, module name, and pretest, Test It, and posttest scores. Unit level pretest and posttest scores were distributed across modules by corresponding objectives. Twenty-nine percent (29%) of modules containing pretest, Test It, and posttest scores were included in the analytical dataset.

### Analysis

A paired-samples t-test was used to determine if the average module posttest score was significantly greater than the average module pretest score by year for each subject. Cohen's  $d$  was used as a measure of effect size.

## Limitations

A single group design was used to analyze the impact of Tutorials use on pretest to posttest gain. Single group design studies are limited by not having a comparison group to control for events unrelated to the intervention that could impact posttest performance. Events unrelated to the intervention include participant maturation, testing, instrument decay, and regression to the mean.

## Outcome Measures

The outcome measure used in this study is the percentage point gain from Tutorials pretest to posttest reported at the module level.

## Appendix

Table 1. Module Level Descriptive Statistics								
SAT® Subject	School Year	Modules	Pretest Score		Test It Score		Posttest Score	
		N	Mean	SD	Mean	SD	Mean	SD
Reading	2016-2017	2,624	39.16	27.11	67.40	30.47	60.78	32.64
	2017-2018	2,094	36.38	27.81	66.65	32.09	60.29	34.27
	2018-2019	3,392	38.15	28.96	74.96	28.59	62.63	32.46
	Total	8,110	38.02	28.09	70.37	30.38	61.43	33.01
Writing and Language	2016-2017	1,483	38.60	28.75	70.62	30.50	62.73	34.78
	2017-2018	1,666	38.11	27.86	72.72	29.98	67.21	33.54
	2018-2019	3,335	47.83	31.23	81.06	26.19	75.84	30.02
	Total	6,484	43.22	30.21	76.53	28.61	70.63	32.56
Math	2016-2017	2,670	36.04	25.49	58.77	30.41	54.83	31.13
	2017-2018	1,743	45.40	27.39	67.34	28.98	64.26	31.06
	2018-2019	7,636	36.34	26.65	73.76	28.11	57.32	30.89
	Total	12,049	37.59	26.70	69.51	29.41	57.77	31.10

Table 2. Paired-Samples T-Test Results										
SAT® Subject	School Year	Pretest Score Mean	Posttest Score Mean	Paired Differences	Std. Dev.	Std. Error Mean	t	df	Sig. (2-tailed)	Effect Size <i>d</i>
Reading	2016-2017	39.16	60.78	21.62	37.01	0.72	29.93	2623	0.00†	0.80
	2017-2018	36.38	60.29	23.91	37.93	0.83	28.84	2093	0.00†	0.86
	2018-2019	38.15	62.63	24.48	37.89	0.65	37.63	3391	0.00†	0.85
Writing and Language	2016-2017	38.60	62.73	24.13	39.05	1.01	23.80	1482	0.00†	0.84
	2017-2018	38.11	67.21	29.09	37.60	0.92	31.59	1665	0.00†	1.04
	2018-2019	47.83	75.84	28.01	36.19	0.63	44.70	3334	0.00†	0.90
Mathematics	2016-2017	36.04	54.83	18.79	32.03	0.62	30.32	2669	0.00†	0.74
	2017-2018	45.40	64.26	18.86	30.87	0.74	25.50	1742	0.00†	0.69
	2018-2019	36.34	57.32	20.98	31.96	0.37	57.36	7635	0.00†	0.79
Total	Reading	38.02	61.43	23.41	37.64	0.42	56.01	8109	0.00†	0.83
	Writing and Language	43.22	70.63	27.40	37.26	0.46	59.22	6483	0.00†	0.91
	Mathematics	37.59	57.77	20.19	31.83	0.29	69.61	12048	0.00†	0.76



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