



Project 1

2017 & 2018 SAT & ACT results

2017 & 2018 ACT results were examined for this project.

Source: [ACT Results](#)

2017 & 2018 SAT results were examined.

Source: [SAT Results](#)

100% participation benchmark reached in 2018 for Colorado State.

1200 average total score was not reached during the 2018 year for Colorado State.

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Introduction



Data Provided:

a. ACT Standardized Test: [Source](#)

The **ACT** (originally an abbreviation of **American College Testing**) is a standardized test used for college admissions in the United States. It is currently administered by ACT, a nonprofit organization of the same name.^[10] The ACT test covers four academic skill areas: English, mathematics, reading, and science reasoning. It also offers an optional direct writing test. It is accepted by all four-year colleges and universities in the United States as well as more than 225 universities outside of the U.S.

b. SAT Standardized Test: [Source](#)

The **SAT** is a standardized test widely used for college admissions in the United States. Since it was debuted by the College Board in 1926, its name and scoring have changed several times; originally called the **Scholastic Aptitude Test**, it was later called the **Scholastic Assessment Test**, then the **SAT I: Reasoning Test**, then the **SAT Reasoning Test**, then simply the **SAT**.

Executive Summary



2018 benchmarks/goals:

- a. Meet/ exceed 100% participation on SAT during the 2018 school year in Colorado State.
- b. Meet/ exceed an average total score of 1,200 or higher on the SAT standardized test.

Executive Summary (cont.)



- After The College Board, makers of the SAT, won over the state of Colorado, the state began its transition to a new testing standard. Colorado has been participating in the ACT since 2001.
- The following project contains data from 2017 and 2018 on the National ACT and SAT testing averages and participation rates.
- This data will help produce a status report on the current average scores as compared to the National average scores and the supporting participation analyses from both the ACT and the SAT for the State or Colorado in 2017 & 2018.

source: [Colorado move to SAT.](#)

Problem Statement



- Working as an analyst on the Colorado State board, you are tasked to compare 2018 Colorado SAT results to the national average and examine participation rates in the state after last years transition to SAT standardized testing.
- You download the National ACT and SAT results for both 2017 and 2018 by State.
- You need to analyze this data using statistical tools and produce graphical explanation for your outcomes.
- You are reporting to your general management team of executives who are not necessarily fluent in Data Science.

Problem Statement (cont.)



You are also required to report on the results of the benchmarks that the Board set last year for the 2018 school year.

The board wants this transition to be beneficial to their national rankings.

Data Dictionary

Please take a moment to familiarize yourself with the data dictionary below.
You will find handy tips on how to interpret the results in the following slides.

2017 ACT/SAT Data Dictionary

Feature	Type	Dataset	Description
state	object	ACT/SAT	US state associated with the score.
participation	float	ACT/SAT	Participation rate/score associated with each test (0-100%)
act_english_2017	float	ACT	Average English score recorded for 2017 on the ACT by State (1-36)
act_math_2017	float	ACT	Average Math score recorded for 2017 on the ACT by State (1-36)
act_reading_2017	float	ACT	Average Reading score recorded for 2017 on the ACT by State (1-36)
act_science_2017	float	ACT	Average Science score recorded for 2017 on the ACT by State (1-36)
act_composite_2017	float	ACT	Average Total score recorded for 2017 on the ACT by State (1-36)
sat_rw_2017	float	SAT	Average Reading/Writing score recorded for 2017 on the SAT by State (200-800)
sat_math_2017	float	SAT	Average Math score recorded for 2017 on the SAT by State (200-800)
sat_total_2017	float	SAT	Average Total score recorded for 2017 on the SAT by State (400-1600)

CO & National Participation Ratings (2017)

ACT test scores were recorded throughout the country in the 2017 school year, and Participation statistics were gathered by state. Colorado had met a 100% participation rate in 2017 and average National participation was at 66% on the ACT.

Figure 1: Colorado participation rate in 2017 was at 100%.

state	act_participation_2017
Colorado	1.0

Figure 2: Statistical descriptions of 2017 ACT National participation results, with a Standard Deviation of 0.32.

	count	mean	std	min	25%	50%	75%	max
act_participation_2017	50.0	0.6592	0.321107	0.08	0.3100	0.71	1.000	1.0

CO & National Participation Ratings (2018)



SAT test scores were recorded throughout the country in the 2018 school year, and Participation statistics were gathered by state.

Colorado had transitioned to an SAT in 2018 and the participation rates are shown below.

Figure 3: In 2018 Colorado State has had a 100% participation rate in the SAT standardized test.

state	sat_participation_2018
Colorado	1.00

Figure 4: Statistics based on SAT National results in 2018

	count	mean	std	min	25%	50%	75%	max
sat_participation_2018	50.0	0.4482	0.370976	0.02	0.0425	0.50	0.745	1.0

CO & National Average Scores (2017)

ACT test scores were recorded throughout the country in the 2017 school year, and English, Math, Reading, Science and Composite score statistics were gathered by state.

Note: Colorado had transitioned to an SAT in 2018.

Figure 5: We can see that in 2017 Colorado had a composite score of 20.8 and about ~ 0.5 Standard Deviations below the National average.

state	act_participation_2017	act_english_2017	act_math_2017	act_reading_2017	act_science_2017	act_composite_2017
Colorado	1.0	20.1	20.3	21.2	20.9	20.8

Figure 6: Statistics based on ACT National results in 2017, the average national composite score was 21.52.

	count	mean	std	min	25%	50%	75%	max
act_participation_2017	50.0	0.6592	0.321107	0.08	0.3100	0.71	1.000	1.0
act_english_2017	50.0	20.8620	2.324307	16.30	19.0000	20.55	23.100	25.5
act_math_2017	50.0	21.1360	1.973990	18.00	19.4000	20.90	23.000	25.3
act_reading_2017	50.0	21.9560	2.046317	18.10	20.4250	21.70	23.875	26.0
act_science_2017	50.0	21.4100	1.731962	18.20	19.9250	21.30	22.975	24.9
act_composite_2017	50.0	21.5260	2.010463	17.80	19.8000	21.40	23.500	25.5

CO & National Average Scores (2018)

SAT test scores were recorded throughout the country in the 2018 school year, and Reading, Writing and Total score statistics were gathered by state.

Note: Colorado had transitioned to an SAT in 2018.

Figure 7: We can see that in 2018 Colorado had a total average score of 1025 with a Standard Deviation of ~ 1.0.

state	sat_participation_2018	sat_rw_2018	sat_math_2018	sat_total_2018
Colorado	1.00	519	506	1025

Figure 8: Statistics based on SAT National results in 2018, the average national total score of 1298.

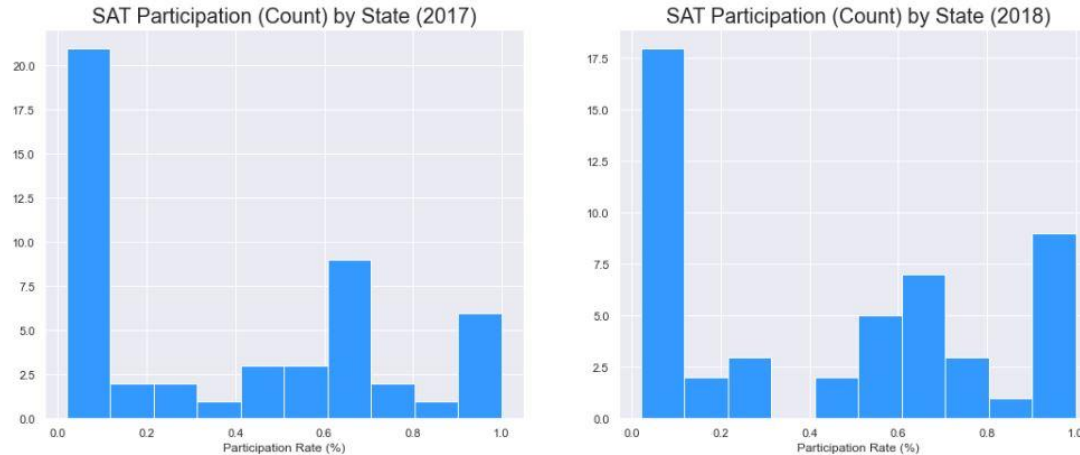
	count	mean	std	min	25%	50%	75%	max
sat_rw_2018	50.0	565.0200	47.010416	480.00	535.0000	552.00	612.750	643.0
sat_math_2018	50.0	557.7600	46.987432	486.00	524.2500	545.50	594.250	655.0
sat_total_2018	50.0	1122.8800	92.845634	998.00	1062.2500	1098.50	1207.000	1298.0

National SAT Participation & Scores (2017-2018)

Additional notes:

SAT participation has increase Nationally from 2017 to 2018.

Figure 9: National participation change between 2017 and 2018 on SATs

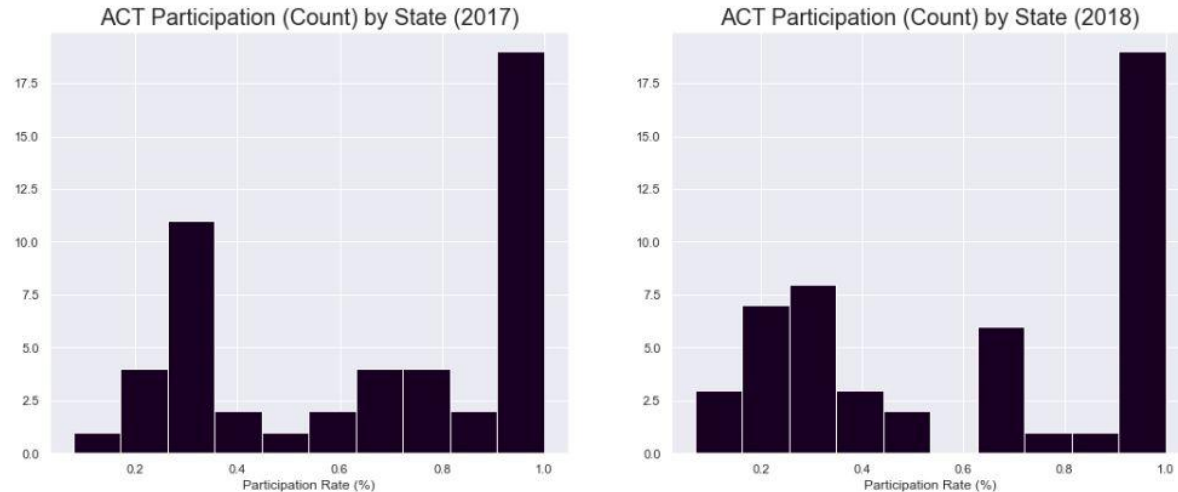


National ACT Participation & Scores (2017-2018)

(Cont.)

ACT participation has decreased Nationally from 2017 to 2018

Figure 10: National participation change between 2017 and 2018 on ACTs



Colorado State SAT scores (2018)



Comparing Colorado SAT test scores to National statistics, we can draw some conclusions about Colorado State's performance in 2018:

- 1) 🏆 Colorado met its benchmark goal of 100% participation in the SAT standardized test in 2018.
- 2) Colorado scored 1 Standard Deviation below the mean for Reading/Writing SAT section in 2018. (2017 = ~ 0.5)
- 3) Colorado scored 1 Standard Deviation below the mean for Math section in SAT 2018. (2017 = ~ 0.5)
- 4) Colorado scored 1 Standard Deviation below the total National average in 2018. (2017 = ~ 0.5)
- 5) Colorado did not meet its goal of 1,200 or more average total score in 2018.
 - a. Colorado excelled on the National Average by 100 points.
- 6) Colorado scored lower on the National SAT by about half of a Standard Deviation.
 - a. Colorado State had the same Standard deviation below the National Average score in 2017 and 2018, ACT and SAT respectively.