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**Introduction to the Analysis:** The following pages include descriptive statistics and letter grade distributions for three new models being currently explored by the ATAC.

In the following few short sections we briefly explain methodologies used for some of the analysis included below and some needed descriptions of the subgroups “free and reduced lunch (FRL)” and “school size”.

### **Letter Grade Cut Scores**

The letter grades in the analysis below follow cut scores based upon standard deviations (“SD” in the tables below) around the mean. To help frame our conversations we included what the FY18 letter grade model would look like had standard deviations of FY18 data been used to set the letter grade cut scores. Due to the methodology of setting letter grades based on standard deviations, the letter grade of the mean is always a C as the maximum value of a C is equal to the mean letter grade within these guidelines. All models use cut scores based on the standard deviation of their data. Below is an explanation of the standard deviation methodology. These cut scores are in no way a recommendation from the ATAC on letter grade cut scores and were simply used as a consistent baseline for comparison.

Letter Grade	Relationship to the Mean
A	Above one standard deviation from the mean
B	Between .01 of the mean and one standard deviation above
C	The mean and within one standard deviation below the mean
D	Between one standard deviation and two standard deviations from the mean
F	Below two standard deviations from the mean

### **Means and Medians:**

We also included a comparison of the letter grades using the median score. The median is the score that is the exact midpoint in the data, where 50 percent of the population is above the median value and 50 percent is below the median value. We included data on the median score to more clearly illustrate the impact of the different models on school performance in the model. Slight rounding was done in the tables provided below for cleaner visualization.

### **Correlations:**

A correlation coefficient is a measure of how closely two variables are in relation to one another. The number that is reported is the strength and direction of the relationship. The range for a correlation coefficient is -1 to +1.

How to read correlation coefficient strength:

- **Exactly -1.** A perfect negative linear relationship
- **-0.70.** A strong negative linear relationship
- **-0.50.** A moderate negative linear relationship
- **-0.30.** A weak negative linear relationship
- **0.** No linear relationship
- **+0.30.** A weak positive linear relationship
- **+0.50.** A moderate positive linear relationship
- **+0.70.** A strong positive linear relationship
- **Exactly +1.** A perfect positive linear relationship

How strong of a relationship is problematic? Generally, a correlation coefficient between  $-0.70$  and  $+0.70$  is viewed as acceptable.

#### **School Size:**

The school size groups used for correlation analysis are also used by other departments in the Arizona Department of Education. In the provided appendix we also look at correlation across raw student enrollment, finding similar relationships.

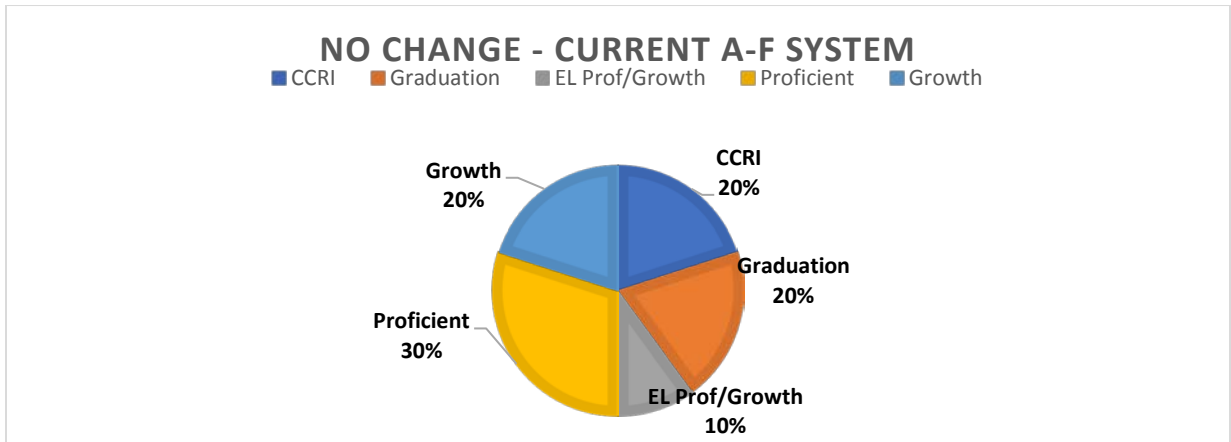
<b>School Sizes</b>
1=100 students or less
2=101 to 350
3=351 to 600
4=601 to 900
5=901 or more

#### **Free or Reduced Lunch:**

The free or reduced lunch groups used for correlation analysis are also used by other departments in the Arizona Department of Education. In the provided appendix we also look at correlation across raw student enrollment, finding similar relationships.

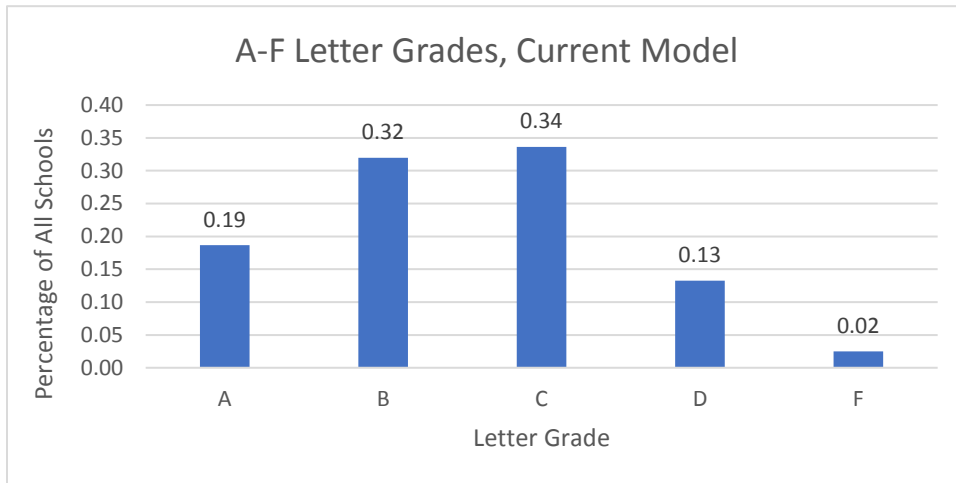
<b>Free and Reduced Lunch</b>
1=25% of students or less
2=26 to 50%
3=51 to 75%
4=76% or more

## Current Model



Mean Percent Earned	Median Percentage Earned	Median Grade	Std. Dev	Minimum	Maximum
70.51	70.85	B	15.59	13.83	104.56

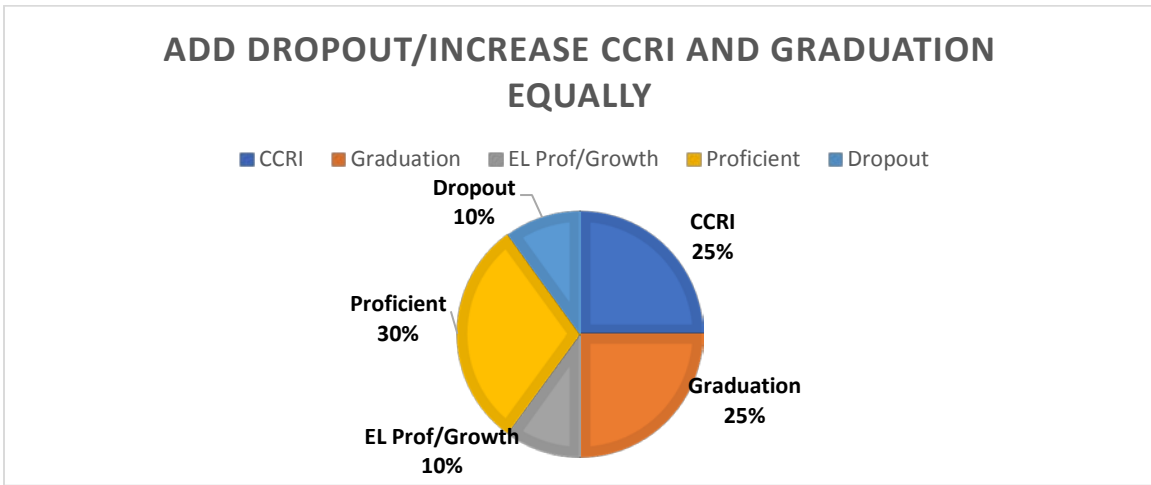
Current Model – SD Cut Scores	Min	Max	Percent
<b>A</b>	86.11		0.19
<b>B</b>	70.52	86.10	0.32
<b>C</b>	54.93	70.51	0.34
<b>D</b>	39.34	54.92	0.13
<b>F</b>	0.00	39.33	0.02



### Correlations to Free and Reduced Lunch and School Size

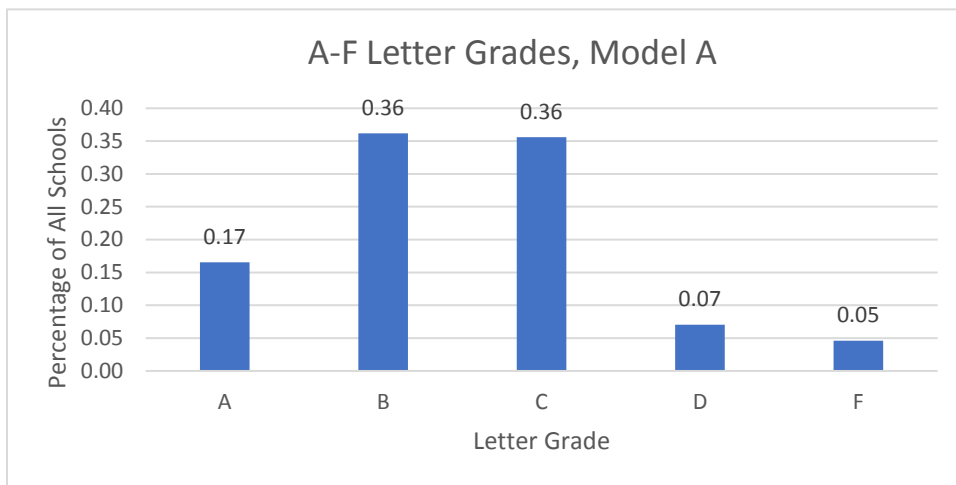
Model	FRL	School Size
<b>Current</b>	-0.37	0.11

## Model A



Mean Percentage Earned	Median	Letter Grade of Median Score	Std Dev	Minimum	Maximum
72.09	72.85	B	15.77	16.75	106.89

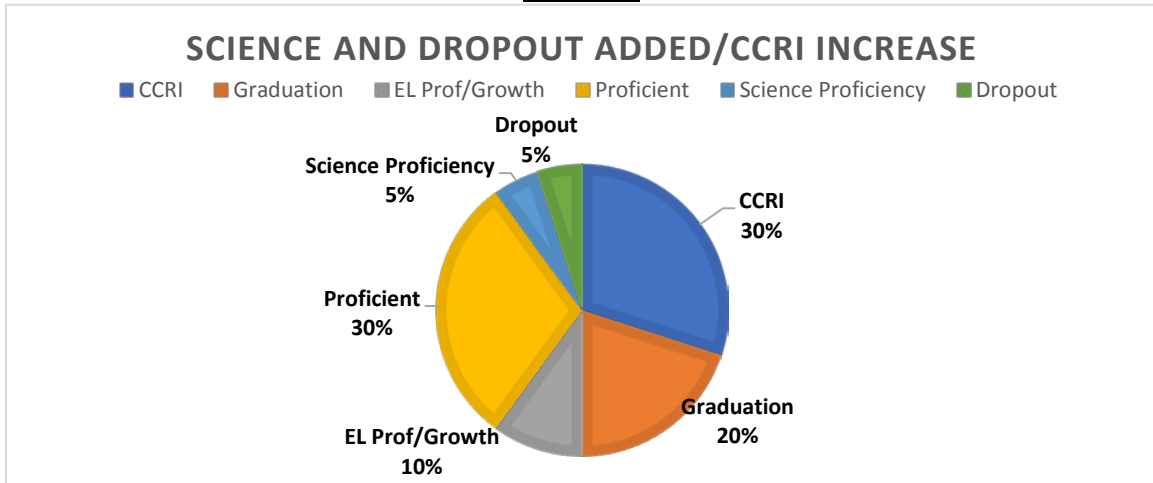
Model A – SD Cut Scores	Min	Max	Percentage
A	87.87		0.17
B	72.10	87.86	0.36
C	56.33	72.09	0.36
D	40.57	56.32	0.07
F	0.00	40.56	0.05



### Correlations to Free and Reduced Lunch and School Size

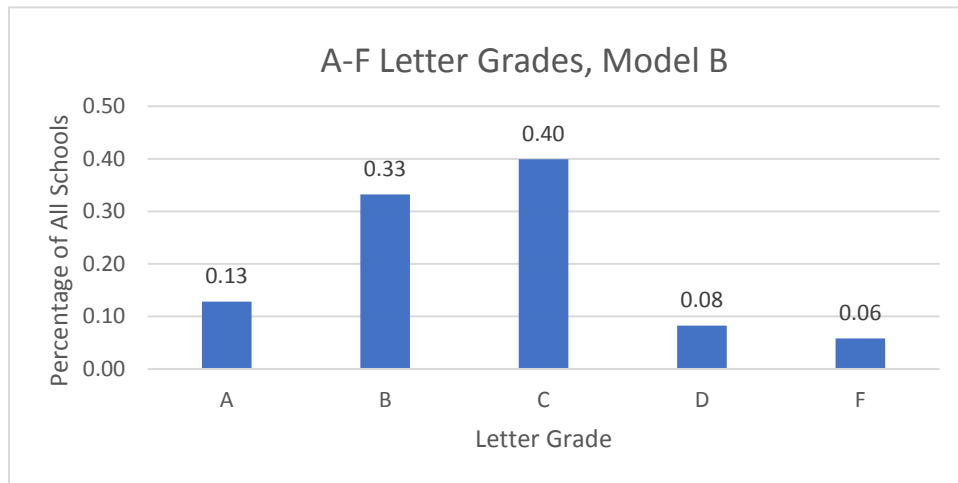
Model	FRL	School Size
Model A	-0.40	0.25

### Model B



Mean Percentage Earned	Median	Letter Grade of Median Score	Std Dev	Minimum	Maximum
64.37	64.55	B	15.57	13.77	100.52

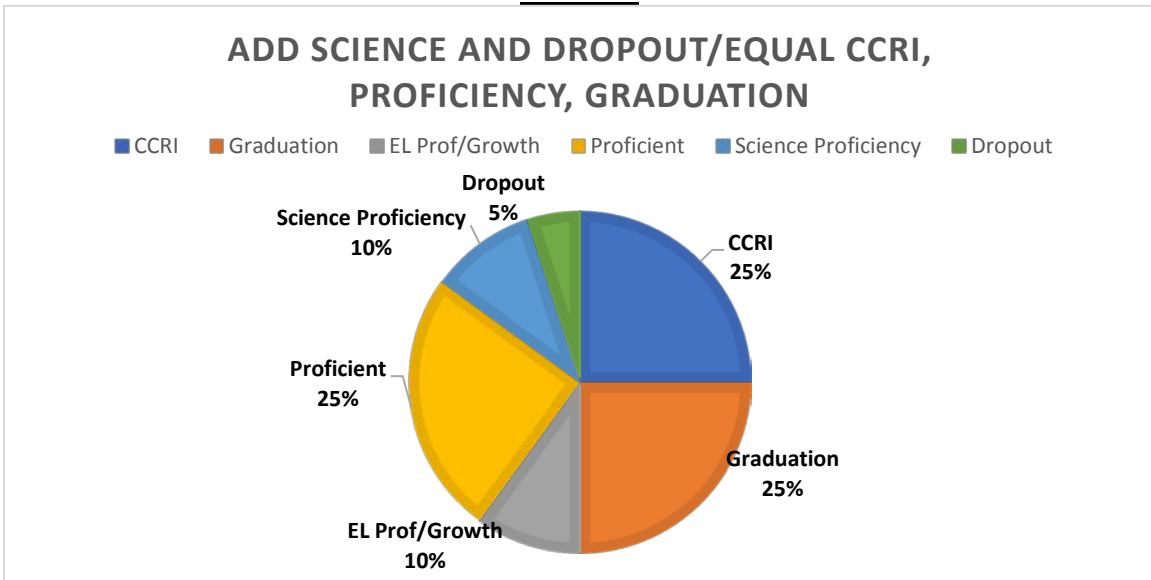
CP Model 4 – SD Cut Scores	Min	Max	Percentage
A	79.95	100	0.13
B	64.38	79.94	0.33
C	48.81	64.37	0.40
D	33.24	48.80	0.08
F	0.00	33.23	0.06



### Correlations to Free and Reduced Lunch and School Size

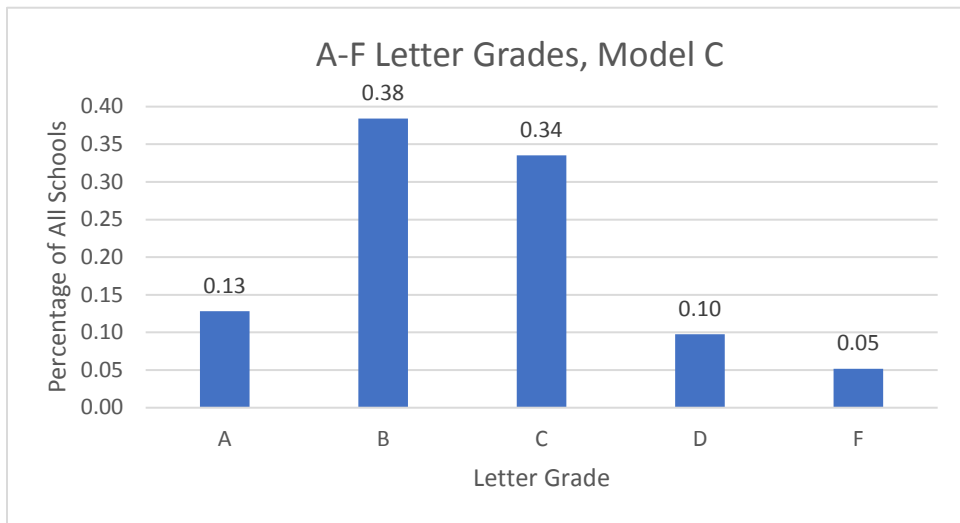
Model	FRL	School Size
Model B	-0.41	0.25

### Model C



Mean Percentage Earned	Median	Letter Grade of Median Score	Std Dev	Minimum	Maximum
67.35	67.88	B	15.83	14.18	103.60

Model C – SD Cut Scores	Min	Max	Percentage
A	83.19	100	0.13
B	67.36	83.18	0.38
C	53.53	67.35	0.34
D	35.70	51.52	0.10
F	0.00	35.69	0.05



### Correlations to Free and Reduced Lunch and School Size

Model	FRL	School Size
Model C	-0.41	0.26