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Date: Feb 21, 2017

From: Adam Larsen, Assistant Superintendent

To: Board of Education

Cc: Thomas Mahoney, Superintendent

Re: Feb 2017 Board Report

## PowerSchool Learning and PowerSchool Assessment

After PowerSchool was acquired by Vista Equity Partners, the company has been purchasing existing educational technology products and merging them into the PowerSchool brand. This has included assessment, learning management, special education, data warehousing, and human resources. Buying and integrating represents a departure from the previous PowerSchool strategy, which was to position the student information system as the center of a wagon wheel and allow school districts to select the various other systems to server as the spokes. There are some positives and negatives to this approach. For school districts that selected a system that was not purchased and integrated, there will likely be a loss of functionality and ability to work with PowerSchool for the exchange of data. For school districts like ours, which were not using any of these types of secondary systems, this means that the products that are about to reach the market will be clear frontrunners in any selection process. We have already seen mockups and wireframes of what these products will look like, and the experiences for teachers, students, and parents will be quite impressive.

Through our close networking with PowerSchool's core development team, the Customer Advisory Board, the Solutions Engineering team, Marketing, and the Product Tailoring division, we have even been afforded opportunities to try out some of these features in demo sites. Based on that experience, PowerSchool Learning and PowerSchool Assessment will likely be the direction we want to go, and we might be able to move sooner than we had originally expected. I recently asked some contacts in Solutions Engineering and Sales about providing a full-scale implementation of these products at a greatly reduced cost in exchange for honest, direct feedback about how the products work, opportunities to study how our teachers, students, and parents utilize the software, and if things go well, the possibility of conducting a marketing case study to share with other school districts. It is unlikely that we can obtain all of the software for free, but I am confident we can work out a deal that allows PowerSchool to try these new offerings in Oregon without requiring us to invest large sums of money to bring it online.

Given that student device pilots have been taking place in the past two years, there are enough classrooms, departments, and grade levels using student devices that teachers have begun asking how they can push content and assessment out to students in real time. These tools are the best candidates for conducting the technology-supported operations of the classroom, so it may be time to begin a rollout with existing devices and allow interest to grow as teachers learn about what is available.

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CUSD220
Academics | Activities | Service | Leadership

## Northwest Evaluation Association (NWEA) Measures of Academic Progress (MAP)

NWEA's Measures of Academic Progress (MAP) test has been used in the school district since the Spring 2008 testing season. This assessment is a form of computer-adaptive testing, where the test taker is presented a series of questions that is tailored to that particular student's academic level. If a student answers a question correctly, the computer will give the student a more difficult question. If the next question is answered incorrectly, the following question will be easier. The number of questions in the test bank is vast, and no two students take the same exact test. This approach offers a number of advantages over traditional testing, including reduced standard error of measurement, less time spent testing, and fewer questions required for each student. Because the assessment is taken on the computer, results are available immediately after a student completes the test. Reports on student progress are available the next day, and growth is tracked over time (season to season and year to year).

In Oregon, the introduction of the MAP assessment has been along the following schedule:

| School Year | Grade 2 | Grade 3 | Grade 4 | Grade 5 | Grade 6 | Grade 7 | Grade 8 | Grade 9 | Grade 10 | Grade 11 | Grade 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007-2008 | | | | S | S | | | | | | |
| 2008-2009 | | | | F, S | F, S | | | | | | |
| 2009-2010 | | F, W, S | F, S | F, S | F, S | F, S | F, S | | | | |
| 2010-2011 | S | F, W, S | F, W, S | F, S | F, S | F, S | F, S | F, S | F, S | | |
| 2011-2012 | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S (SpEd) | F, W, S (SpEd) | | |
| 2012-2013 | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S (SpEd/ELL) | F, W, S (SpEd/ELL) | F, W, S (SpEd/ELL) | F, W, S (SpEd/ELL) |
| 2013-2014 | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S (ELL) | F, W, S (ELL) | F, W, S (ELL) | F, W, S (ELL) |
| 2014-2015 | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | | | | |
| 2015-2016 | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | F, W, S | | | | |
| 2016-2017 | F, W | F, W | F, W | F, W | F, W | F, W | F, W | | | | |

F=Fall, W=Winter, S=Spring

The Winter 2017 testing window was recently completed, and 1692 individual test events were recorded. Many personnel are involved in the testing window, including principals, teachers, aides, and tech staff, and all deserve recognition for their efforts.

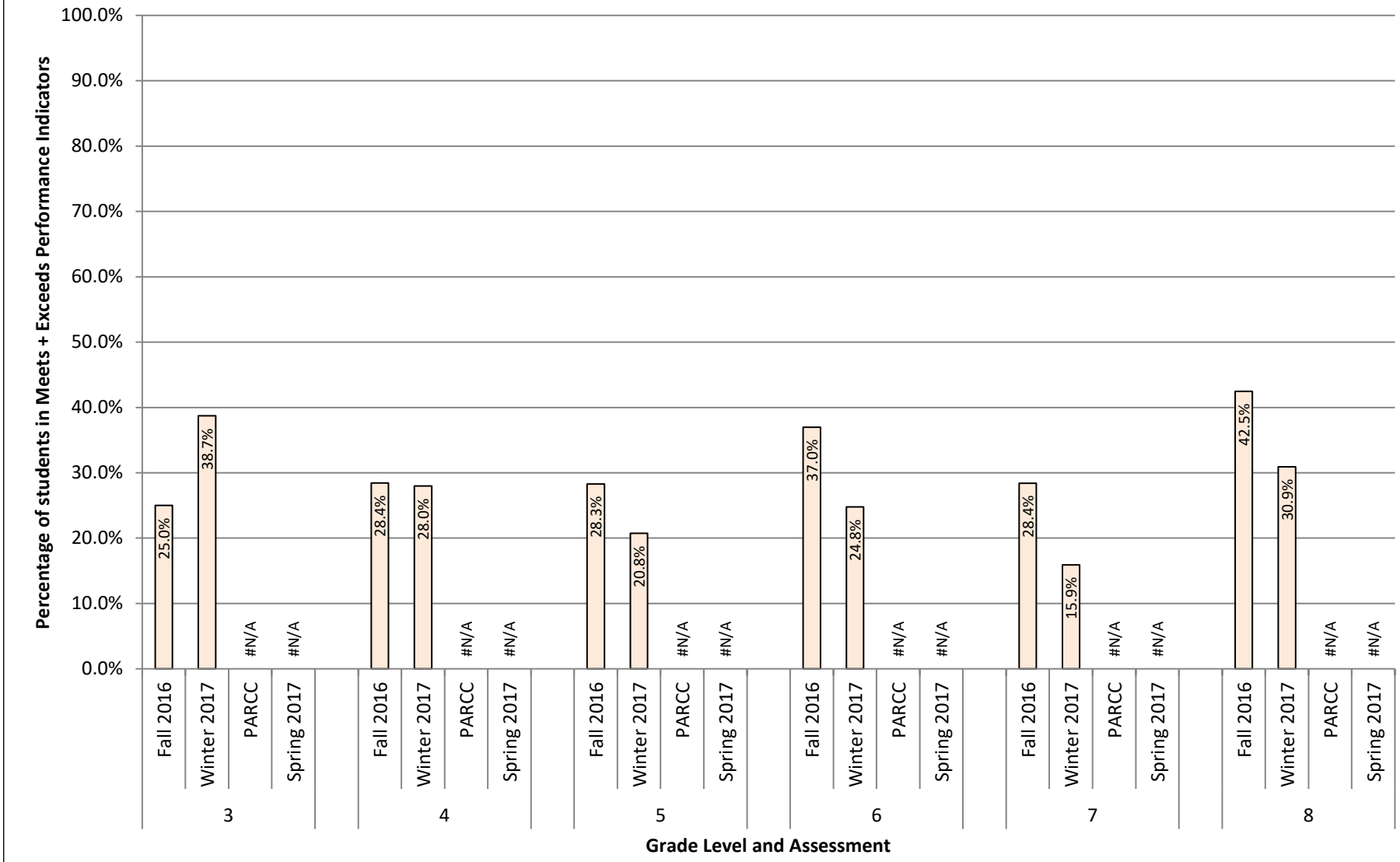
OREGON
CUSD220
Academics | Activities | Service | Leadership

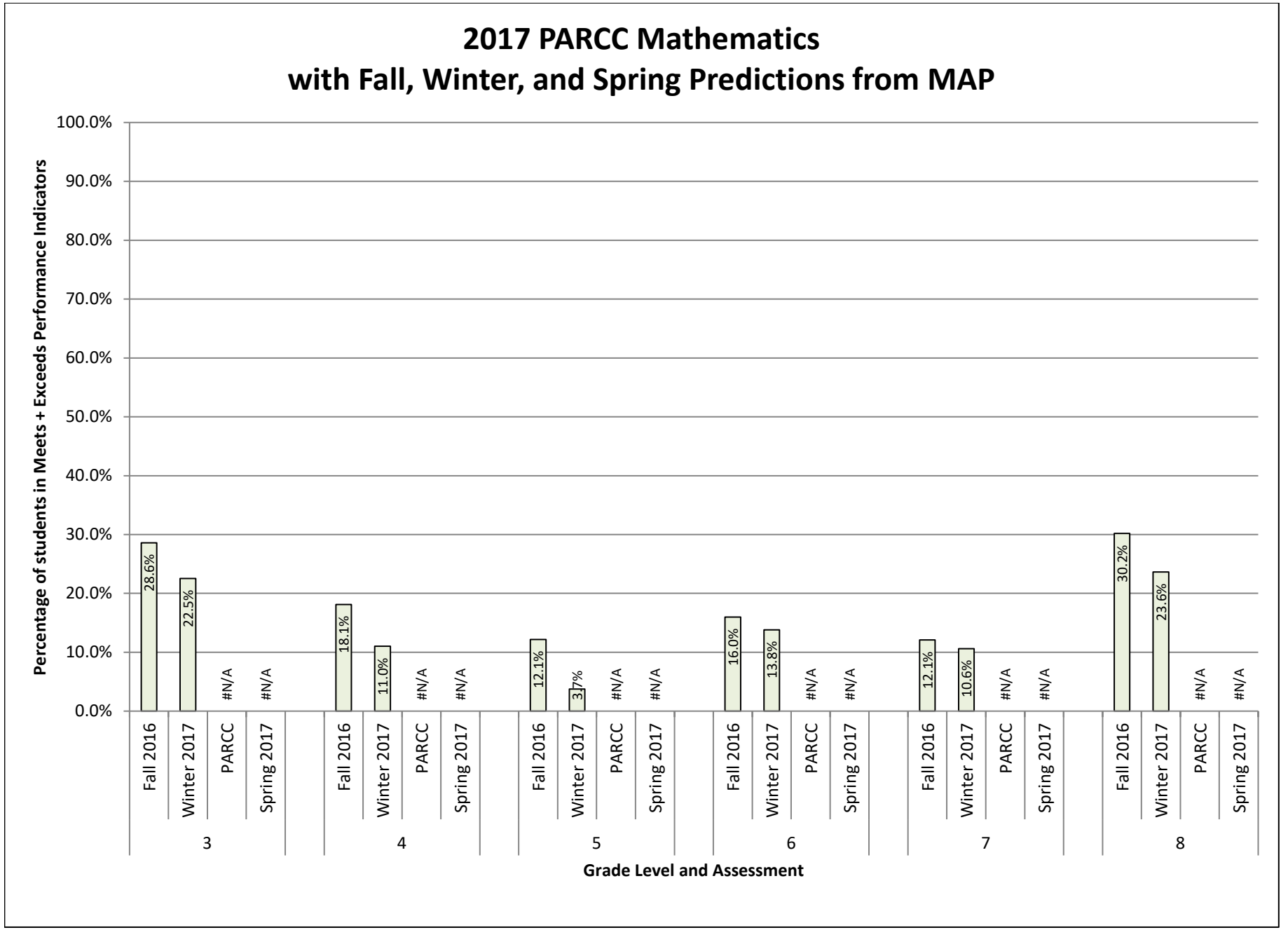
## Predicting the 2017 PARCC

NWEA released updated MAP-PARCC correlate cutscores in March of 2016. These cutscores allow school districts to make predictions about which students are expected to meet and not meet expectations when they take the PARCC each spring. This analysis is useful both for 1) program evaluation, determining how well the overall curriculum is working to prepare students, and 2) resource allocation, identifying which students need additional support to make the gains they need to close the achievement gap with their peers.

A summary of expected performance in Reading and Mathematics follows. These graphs are used each year to track cohort progress toward the expected goal. By plotting the achievement tests on a consistent scale each term, it allows for easy comparisons to be made after every testing season. On these charts, which will be updated periodically throughout the 2016-2017 school year, predictions of PARCC performance based on MAP scores will be plotted alongside actual PARCC performance from the same school year.

# 2017 PARCC Reading
# with Fall, Winter, and Spring Predictions from MAP




2017 PARCC Mathematics
with Fall, Winter, and Spring Predictions from MAP
Percentage of students in Meets + Exceeds Performance Indicators
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
28.6%
22.5%
#N/A
#N/A
18.1%
11.0%
#N/A
#N/A
12.1%
3.7%
#N/A
#N/A
16.0%
13.8%
#N/A
#N/A
12.1%
10.6%
#N/A
#N/A
30.2%
23.6%
#N/A
#N/A
Fall 2016
Winter 2017
PARCC
Spring 2017
3
4
5
6
7
8
Grade Level and Assessment

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CUSD220
Academics | Activities | Service | Leadership

## AMOS Early Warning System

We have gone through several iterations of early warning systems since the 2011-2012 school year. The original ideas emerged through discussions at DLR when we tried to create a more systematic way of identifying students for the Hawks Take Flight program for freshmen. After reading some current research from the academic literature, we identified several key student variables and began organizing data in ways that would make at-risk students stand out from their peers.

The basic premise behind early warning systems is that students who drop out of high school already show signs of disengagement by late elementary school. Poor attendance, low grades, discipline issues, frequent health issues, and other signals can be pulled together to paint an overall picture of risk. Most schools and warning systems focus on cutscores. With statistical analysis, it is possible to draw conclusions such as, "Students who miss 7 or more days of school in 8$^{th}$ grade are 50% more likely to drop out of high school before the end of 11$^{th}$ grade." This type of analysis requires large longitudinal datasets and sufficient dropouts to set such cutscores. We have neither of those things, so we have turned to a normative approach for combining risk.

Rather than spend time trying to figure out at what point a student is considered "at-risk," we standardize each risk factor and simply average them to produce an overall level of risk. We are unable to make pronouncements about how much risk is being demonstrated, but this is really only useful for research purposes. Instead, we recognize that we are able to pour intense, Tier III mentoring, intervention, and remediation energy into a small number of students. This approach is a sorting algorithm that naturally bubbles the most at-risk students to the top of the list. This is where the intervention starts.

Early iterations of this approach were used for articulation across years. As students arrived to new grade levels, an accompanying spreadsheet would follow them to let these teachers know who demonstrated disengagement toward the end of the previous year. This expanded up and down to cover pretty much all of grades 5 through 12. Eventually, teacher teams began asking about receiving early warning system (EWS) data more frequently, as often as once per quarter. During the 2015-2016 school year, we even experimented at the high school with a weekly report that plotted changes in these variables over time to see who was doing better or worse than the previous week. This proved to be a lot to manage and was somewhat confusing to interpret.

The most recent version of this project represents the culmination of several years of research, discussion, experimentation, data migration, and technological growth. With the exception of assessment score data, everything that we collect on students has been migrated to PowerSchool. This means attendance, grades, discipline, health records, community service, activity involvement, homework completion, and many other data points now reside in the same normalized database. This involved decommissioning many legacy systems that had served standalone purposes and building new ones to replace them, a process that took several years.

The final piece of the puzzle was our own growth as software developers. PowerSchool leverages some popular code libraries that make development in their framework more possible, and once we learned how those work, we were able to create a version of the EWS that displays data essentially in real time and that allows school personnel the ability sort, filter, and weight the risk factors in ways that vary with the given purpose. While a teacher might first be interested in seeing overall risk levels for students, she might secondarily want to see all student who have 10 or more discipline referrals in the current year. A principal may wonder how closely attendance and GPA are correlated in the

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CUSD220
Academics | Activities | Service | Leadership

freshman class. An interventionist might want a list of students who are missing 5 or more assignments in the current term.

All of these data requests can be self-served using the Angular Merger of Signals (AMOS) Early Warning System. Once loaded, the grid of data can be adjusted on the fly to serve whatever the need is, and the heatmapping function of the data tool helps identify outliers quickly and easily. The sorting algorithm can even be tweaked to account for relative importance of each factor, depending on what the user may want to see as a priority. In the case where someone may want to show a student his or her current performance on each of these factors, the names of other students can be masked out to protect privacy. Each factor can be drilled into to see detailed data about the student with a single click. We have never before been able to connect people with data in such an easy-to-use but versatile format.

We are very excited about the future of the AMOS EWS. We think it will be a powerful tool to help identify students who previously may have flown under the radar. It is certainly not finalized, and we sincerely hope that as we begin to use the tool in all three buildings, more improvements and additions are made. Some screenshots of AMOS follow.

Respectfully Submitted,

Adam P. Larsen
Assistant Superintendent
Oregon Community Unit School District 220

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CUSD220

Academics | Activities | Service | Leadership

# Amos Early Warning System

Data refresh: 2017/2/14 20:14:59

Basic Filter

Clear Apply

420 of 420 items

| | | | Weights: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Student Number | Student | Grade | z | Weighted GPA | Weighted GPA (Current) | Attendance (%) | Missing Assignments | Activities | Referrals | Community Service Hours | Health Visits |
| | | 9 | -2.80543 | 0.719 | 1.714 | 84.35 | 52 | 0 | 47 | 23.17 | 16 |
| | | 10 | -2.50709 | 1.097 | 1.523 | 54.84 | 46 | 0 | 9 | 1 | 6 |
| | | 9 | -2.47523 | 0.723 | 0.534 | 69.13 | 14 | 0 | 65 | 10.67 | 5 |
| | | 9 | -2.16199 | 0.877 | 2.112 | 93.04 | 17 | 0 | 22 | 14.67 | 32 |
| | | 10 | -1.90789 | 1.926 | 3.002 | 84.78 | 12 | 0 | 85 | 14.17 | 7 |
| | | 10 | -1.90441 | 1.036 | 2.167 | 80.43 | 30 | 0 | 24 | 10.67 | 10 |
| | | 9 | -1.62356 | 1.053 | 1.112 | 96.52 | 32 | 0 | 41 | 14.67 | 1 |
| | | 11 | -1.59027 | 1.647 | 3.332 | 89.57 | 6 | 0 | 49 | 10 | 17 |
| | | 12 | -1.52467 | 1.032 | 1.222 | 81.96 | 29 | 0 | 12 | 1 | 1 |
| | | 10 | -1.45494 | 1.176 | 2.534 | 83.48 | 5 | 0 | 18 | 9.67 | 16 |
| | | 9 | -1.44854 | 1.19 | 2.333 | 86.52 | 33 | 0 | 19 | 1.67 | 2 |
| | | 10 | -1.43209 | 1.56 | 1.668 | 85.65 | 16 | 2 | 31 | 58.37 | 11 |
| | | 10 | -1.29205 | 1.73 | 1.669 | 91.3 | 22 | 0 | 37 | 19.17 | 0 |
| | | 9 | -1.25590 | 2.108 | 2.287 | 88.7 | 11 | 0 | 22 | 5 | 12 |

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CUSD220
Academics | Activities | Service | Leadership

# Amos Early Warning System

Data refresh: 2017/2/14 21:15:01

Filter (1) Referrals

Basic Filter

Referrals >= 10

Clear Apply

12 of 197 items

| | | | Weights: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Student Number | Student | Grade | z | Weighted GPA | Weighted GPA (Current) | Attendance (%) | Missing Assignments | Activities | Referrals | Community Service Hours | Health Visits |
| | | 7 | -1.07963 | 1.918 | 2.667 | 93.91 | 12 | 0 | 10 | 4.65 | 11 |
| | | 7 | -0.60623 | 2.388 | 2.455 | 99.13 | 8 | 1 | 10 | 6 | 1 |
| | | 8 | -0.25766 | 3.19 | 3.349 | 95.65 | 8 | 2 | 10 | 68.95 | 7 |
| | | 8 | -1.03613 | 1.915 | 2.476 | 92.17 | 17 | 1 | 11 | 18 | 5 |
| | | 7 | -0.46429 | 2.25 | 3.515 | 99.13 | 4 | 4 | 11 | 1 | 14 |
| | | 7 | -0.55097 | 2.585 | 3.153 | 99.13 | 6 | 0 | 11 | 0 | 0 |
| | | 8 | -1.57836 | 1.509 | 2.334 | 82.22 | 27 | 0 | 12 | 5 | 3 |
| | | 7 | -0.63907 | 2.473 | 3.668 | 96.96 | 2 | 1 | 14 | 6.5 | 10 |
| | | 8 | -1.62236 | 1.722 | 2.35 | 88.7 | 13 | 0 | 15 | 10 | 23 |
| | | 8 | -1.57015 | 1.447 | 2.333 | 86.09 | 15 | 0 | 17 | 15.8 | 11 |
| | | 8 | -0.91457 | 1.3 | 2.461 | 93.04 | 10 | 5 | 20 | 35.5 | 5 |
| | | 7 | -1.82029 | 2.389 | 2.182 | 90.87 | 11 | 4 | 27 | 40 | 42 |

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CUSD220
Academics | Activities | Service | Leadership

# Amos Early Warning System

Data refresh: 2017/2/14 21:15:01

Filter (2) — Referrals, Attendance (%)

Basic Filter

Referrals >= 10

Attendance (%) < 90

Clear Apply

3 of 197 items

| | | | Weights: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Student Number | Student | Grade | z | Weighted GPA | Weighted GPA (Current) | Attendance (%) | Missing Assignments | Activities | Referrals | Community Service Hours | Health Visits |
| | | 8 | -1.57836 | 1.509 | 2.334 | 82.22 | 27 | 0 | 12 | 5 | 3 |
| | | 8 | -1.62236 | 1.722 | 2.35 | 88.7 | 13 | 0 | 15 | 10 | 23 |
| | | 8 | -1.57015 | 1.447 | 2.333 | 86.09 | 15 | 0 | 17 | 15.8 | 11 |