## School Growth Explanation: School Value-Added Growth

What is a Growth Model?

A growth model describes the change in student achievement over a period of time. The growth model used in Arkansas is a value-added growth model that helps answer the question:

> *How much did a student grow this year compared to how much we thought he/she would grow based on what we know about his/her achievement in prior years (the student's score history)?*

The chart below illustrates how a value-added score is determined for a student.
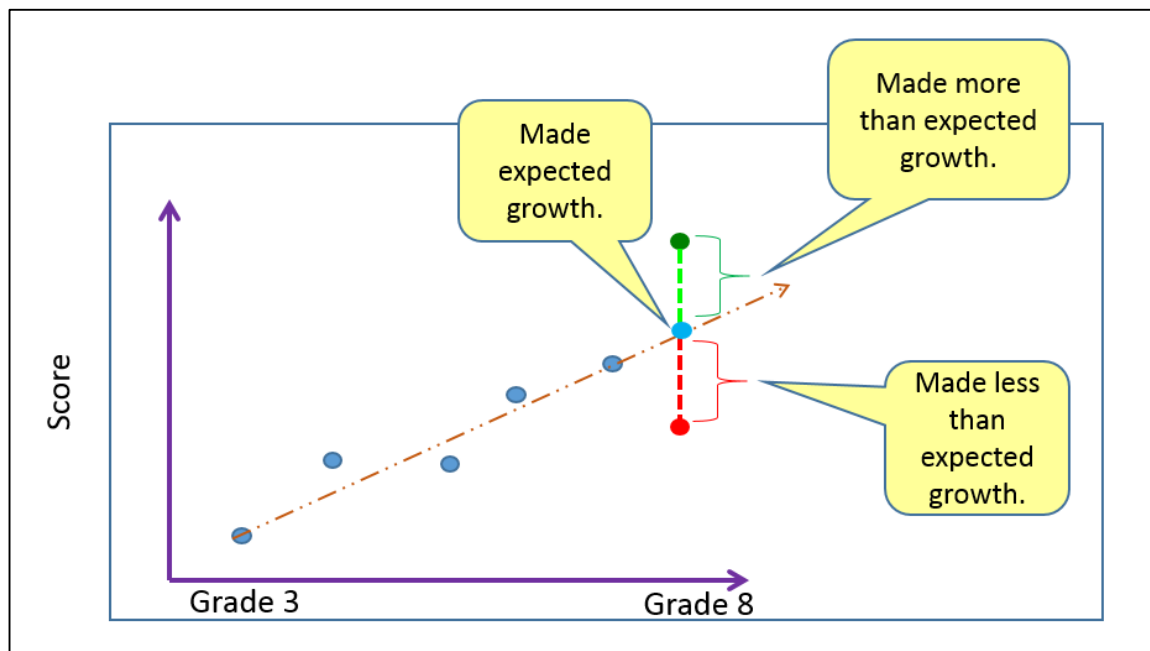
The student growth score is the difference between what the student is expected to achieve, based on prior achievement scores, and what the student achieves in the current year. Each growth score tells us whether each student performed as well as expected, based on how he/she performed in earlier years. We expect students to meet or exceed their expected growth if they are to be ready for college, career, and life.

Why Use a Value-added Model?

A value-added model helps separate the effects of non-school related factors (e.g. poverty) on the student's change in achievement so that the student's growth expectation is more precise. This means students are expected to learn and grow by at least a certain amount each year based on their own score history, regardless of how high, low, or average their achievement is entering the year.

Student Growth in English Language Arts (ELA), Math, and English Learner Proficiency

Student value-added growth scores are calculated for English language arts (ELA), math, and English learner proficiency.

- Student value-added growth for the English language arts and math are based on students' score histories for each content area.
- Student value-added growth in English learner proficiency is based on the student's score history on the English language proficiency assessment: ELDA prior to 2016 and ELPA21 for 2016 forward.

The process for calculations are the same for student growth in English language proficiency as for math and ELA growth as illustrated in the chart on page 1. For value-added growth in English learner proficiency the score history used is taken from the English language proficiency test rather than the content assessment. Each student receives a value-added score for growth in English language arts, math, and/or English language proficiency that will range from negative to positive values with zero representing the student met expected growth as indicated in the figure below.
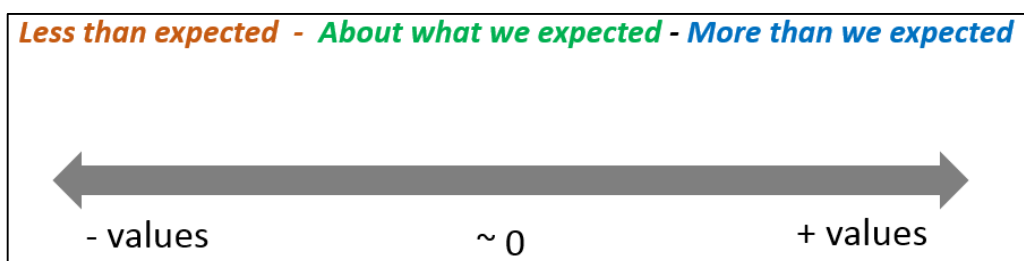
- **Positive value-added student scores:** If the student has a value-added score with a positive value, the student's achievement exceeded growth expectations for the year. The student had higher than expected growth. The greater the value above zero, the more the student exceeded expectations.
- **Value-added student scores at/around zero:** If the student has a value-added score value of zero, the student's achievement met expected achievement. The student grew at least as much as expected.
- **Negative value-added student scores:** If the student has a value-added score with a negative value, the student did not meet expectations for growth in achievement for the year. The student did not grow as much as expected in achievement. The lower the value of the value-added score, the larger the degree to which the student did not grow as much as expected.

Calculating School Value-added Growth Scores Used in the ESSA School Index

School value-added growth scores (VAS) include student growth in the content areas (math and English language arts) as well as student growth in English language proficiency as illustrated in the figure below.
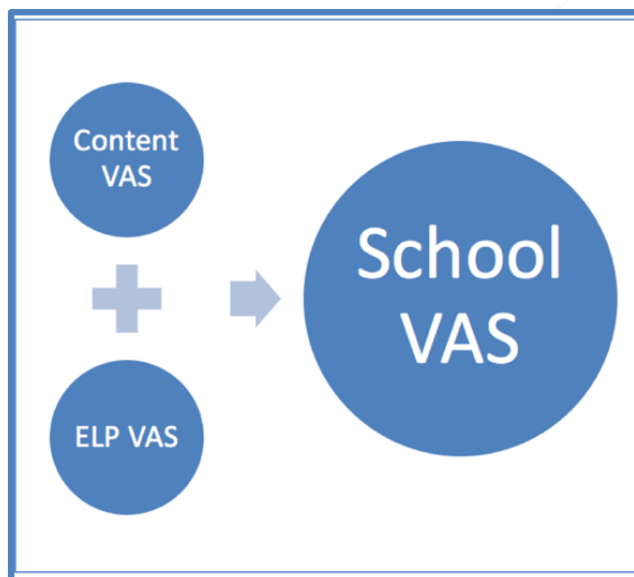
The following steps are used to combine the ACT Aspire math and ELA content VAS and English language proficiency VAS into a single school growth score.

1. The mean content area value-added score (content VAS) is obtained for each school. Students' math and English language arts growth scores are averaged to obtain the content VAS. The content VAS for a school indicates, on average, the extent to which students in the school grew in math and English language arts achievement compared to how much we expected them to grow, accounting for how the students had achieved in prior years.
   a. The content VAS answers the question, *"On average, did students in this school meet, exceed, or not meet expected growth in math and English language arts achievement?"*

2. Second, a mean English language proficiency value-added score (ELP VAS) is obtained for each school that has one or more English learners. The ELP VAS indicates, on average, the extent to which students in the school grew in English language proficiency compared to what was expected, accounting for how the student had been progressing in English language in prior years.
   a. The ELP VAS answers the question, *"On average, did students in this school meet, exceed, or not meet expected growth in English language*

proficiency?"

3. Third, a weighted sum of the content VAS and ELP VAS is divided by the total number of students contributing to the content VAS (each student counting once with a combined math and English language arts value-added score) plus the total number of students contributing an ELP VAS.
   a. Similar to the concept of a sliding scale, this step allows English learners' growth scores to contribute to the mean school value-added score proportionate to the population of English learners in the school. This is illustrated in the equation below.

$$School\ Value\text{-}added\ Score = \frac{(\#Students\ w\ Content\ VAS\ X\ Content\ VAS)\ +\ (\#\ ELs\ w\ ELP\ VAS \times ELP\ VAS)}{\#\ of\ Students\ w\ Content\ VAS + \#\ ELS\ w\ ELP\ VAS}$$

Transforming School Value-added Scores to Include in Accountability and Rating

To include the school value-added growth score in the school performance system, the values must be transformed to a 100-point scale that will work within the total point scale for the rating system. Value-added scores are transformed using the equation below.

$$School\ Growth\ Score = (School\ Value\text{-}added\ Score\ \times 35) + 80.00$$

The Arkansas Department of Education determined the intercept to be 80 through a series of input sessions where stakeholders were asked to indicate what "score" a school should earn if students, on average, were meeting their expected growth. Input ranged from a scores of 75 up to scores of 85). Thus, a score of 80 was selected to represent the value-added score of 0. The transformed score of 80 is the school growth score that indicates students, on average, met expected growth. The figure below illustrates how the school growth scores can be interpreted.
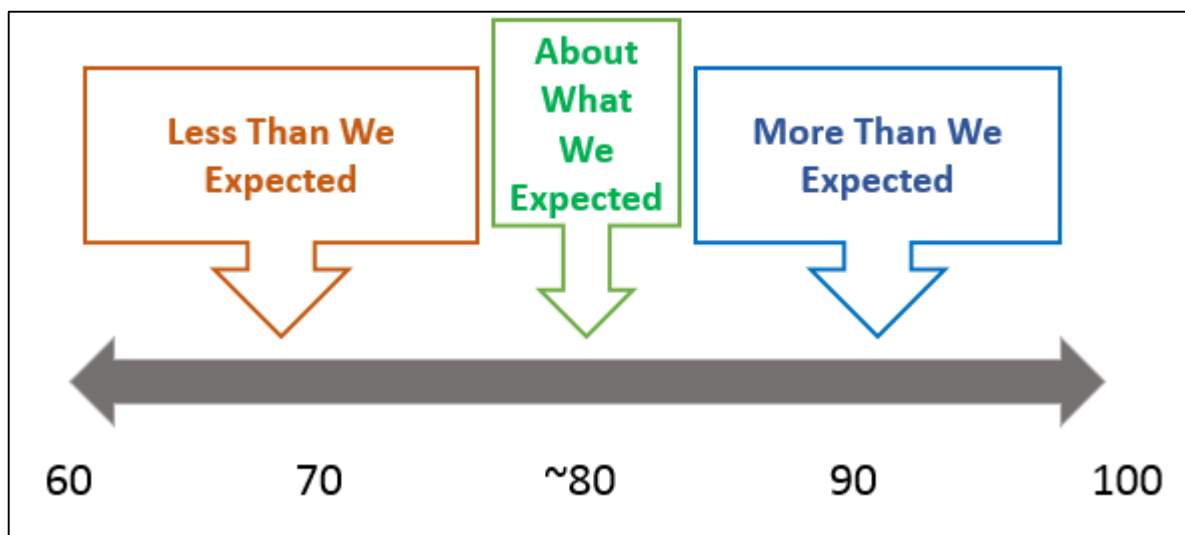
What are School Mean Value-Added Scores?

Examples of the transformations for mean school value-added scores are provided below.

- Positive value-added score: Mean value-added score = 0.50

$$School\ Growth\ Score\ = (0.50 \times 35) + 80.00$$
$$= 17.5\ + 80.00$$
$$=\ 97.50$$

- Zero value-added score: Mean value-added score = 0.00

$$School\ Growth\ Score\ = (0.00 \times 35) + 80.00$$
$$= 0.00\ + 80.00$$
$$=\ 80.000$$

- Negative value-added score: Mean value-added score = - 0.21

$$School\ Growth\ Score\ = (-0.21 \times 35) + 80.00$$
$$= -7.35\ + 80.00$$
$$=\ 72.65$$

School growth scores typically range from 60.00 to 100.00 with scores below 70 representing the extremes of lower than expected growth and scores above 90 representing the extremes of higher than expected growth. Please note that school-level English learner proficiency value-added scores and all student level value-added scores have a much wider range of values that must be interpreted within that wider range of values. Averaging content area value-added growth scores at the school level results in less variation among school growth scores which means that values must be interpreted within this narrower range.

For school-level value-added growth scores in English learner proficiency, the range of scores is wider than for school-level content area growth because there are fewer schools with English learners and the number of English learners in schools varies widely in the schools that serve English learners.

Inclusion Rules for School Growth Scores

Students completing a full academic year (not highly mobile) and completing the math and/or English language arts assessments (ACT Aspire or alternative assessment) or the English language proficiency assessment (ELPA21) are included in the school growth score.

How Can I Interpret the School Mean Value-Added Scores?

School mean value-added scores range from approximately 60 to 100. Student groups that are smaller than 15 may have values higher or lower than the range if one or two students have very high or very low growth scores among the small number of students included in the mean.

- **Scores of 80 —** On average, students in the school made expected growth this year. A score of 80 can mean that some students made more growth than others while some students lost ground. A score of 80 can mean that most students made expected growth.
- **Scores below 80 —** On average, students in the school made less than expected growth this year. Some students may have met or exceeded their growth expectation, but enough students lost ground or a few students may have lost significant ground to result in a score below 80.
- **Scores above 80 —** On average, students in the school made more than expected growth this year. Some students may have lost ground or met their growth expectation, but enough students exceeded or a few students exceeded by a significant amount to result in a score above 80.

Important Note!

There is a margin of confidence around the school mean value-added growth. Scores that are close to 80, both slightly above and slightly below, are likely to represent expected growth, on average. The size of the margin of confidence for a score depends on how many students are included in the mean. Larger groups have smaller margins because a single extreme score won't impact the mean as much. Smaller groups have larger margins because a single extreme score can impact the mean quite a bit!

School mean value-added scores represent one piece of information among many that are important for understanding more about school quality and student success and should be interpreted and used in combination with other information about a school.