

## Answers to Parents' Questions about Student Growth

Parents often have questions about the kinds of information that score reports provide and about how they can use that information to help their students succeed. This is especially true about ACT Aspire<sup>®</sup>, which measures student growth over time. This report describes how student growth is reported on ACT Aspire and then answers several common questions about how to use the growth information.<sup>1</sup> We illustrate our answers with examples showing how the growth models work.

### How ACT Measures Student Growth

Student achievement can be characterized in two main ways. Status measures tell us how students are doing now and answer questions such as “Is this student ready for college?” Growth measures, on the other hand, provide information about how much a student has learned over time and answer questions such as “How much progress has this student made during the past year toward being ready for college?”

There are a variety of statistical methods available for supporting interpretations of student growth.<sup>2</sup> Each method has unique advantages and disadvantages, which is why multiple methods support growth interpretations from students' ACT Aspire scores: gain scores, student growth percentiles, ACT Readiness Benchmarks, and predicted score paths.<sup>3</sup>

- **Gain scores** are the arithmetic differences in a student's test scores from one grade to another. Each ACT Aspire subject test except Writing is on a common scale across grade levels, allowing comparisons of scores over time. For example, if a student scores 421 on the third-grade Reading test and a 425 in fourth grade, the student's gain score is 4. Gain scores are often discussed in terms of how an individual student's gain score from one grade to the next compares to the average gain score for all students moving between the same grades.
- **Student growth percentiles (SGPs)** represent the relative standing of a student's current achievement compared to that of students with similar prior achievement (that is, score histories). SGPs can range from 1 to 100. Higher values indicate higher levels of growth than other, similar students. A student with an SGP of 30 in mathematics scored higher than 30 percent of students with similar score histories.
- **ACT Readiness Benchmarks** indicate whether a student taking ACT Aspire is on target to meet corresponding ACT College Readiness Benchmarks on the ACT® test. The ACT College Readiness Benchmarks represent the level of achievement required for students to have a 50 percent chance of obtaining a grade of B or higher, or about a 75 percent chance of obtaining a C or higher, in corresponding credit-bearing first-year college courses (English Composition, College Algebra, introductory social science courses, and Biology).<sup>4</sup>
- **Predicted score paths** provide information about where a student (or group of students) is likely to score in future years assuming average annual growth, which depends on the subject area and grade level. For example, the predicted score path can be used to determine if a student is likely or unlikely to meet the ACT Readiness Benchmarks in two years, or, for students in grades 9 and 10, to predict the range of the student's likely performance on the ACT.

For more in-depth explanations of growth models, see *A Practitioner's Guide to Growth Models* by Katherine Castellano and Andrew Ho.

Each of these features of ACT Aspire provides information that can help answer questions parents have about student growth.

## ACT Aspire

ACT Aspire is an aligned, longitudinal college and career readiness assessment system for students in grades 3–10 that provides insights into student performance in English, reading, mathematics, science, and writing in the context of college and career readiness. For more about ACT Aspire, visit [www.discoveractaspire.org](http://www.discoveractaspire.org).

## The ACT Test

The ACT is a college readiness assessment with tests in English, reading, writing, mathematics, and science. Students taking the ACT receive scores for each subject test, a Composite score, an ELA score for performance in English language arts, a STEM score for science and mathematics, and ACT College Readiness Benchmark information. For more about the ACT, visit [www.act.org](http://www.act.org).

## Questions Parents Often Ask

### Did my student demonstrate sufficient growth over the past year?

Gain scores and student growth percentiles (SGPs) can help answer this question.

#### Gain Scores

Gain scores can be used to determine if a student has performed close to the average of other students when going from one grade to the next. Gain scores on ACT Aspire are calculated by subtracting the prior year's score from the current year's score. Table 1 gives the average gain scores of all students from one grade to the next on ACT Aspire as well as the standard deviations (that is, a measure of variation). Comparing individual student gain scores to these average scores can show how a student has grown relative to the student's peers. For example, a fifth-grade student in mathematics with a gain score of 3 would have demonstrated approximately a year's worth of average growth since fourth grade.

Growth data for individual students are often imprecise. To assess progress, growth data should be viewed in combination with other data about a student, such as course performance and teacher feedback.

The standard deviations of the gain scores indicate there is considerable variation in gain scores across students. Most students will have a gain score within one standard deviation of the mean. Consider fourth-grade students in mathematics: 76 percent of students had a gain score between 0 (approximately one standard deviation below the mean) and 7 (approximately one standard deviation above the mean).

Some students will have small or even negative gain scores. Because gain scores are imprecise, negative gain scores do not imply that a student made no learning progress.

Table 1. ACT Aspire Average Gain Scores (and Standard Deviations)

Grade Level Pair	Subject Area			
	English	Mathematics	Reading	Science
3–4	3.7 (4.8)	3.1 (3.5)	2.8 (4.1)	3.3 (4.5)
4–5	2.9 (5.2)	2.5 (4.1)	2.5 (4.3)	2.2 (4.5)
5–6	2.0 (5.8)	3.0 (4.7)	2.6 (4.7)	1.9 (4.7)
6–7	2.3 (6.1)	0.4 (5.0)	0.7 (4.9)	1.2 (5.1)
7–8	1.6 (6.3)	2.5 (4.9)	3.0 (5.1)	2.8 (5.3)
8–9	1.0 (5.9)	1.4 (4.9)	0.0 (5.5)	1.8 (5.6)
9–10	0.9 (6.2)	1.2 (5.2)	1.0 (5.6)	1.2 (6.4)

#### Tip

Because individual student gain scores are whole numbers, when comparing your student's gain score to those in the table, round the table value to the nearest whole number.

Source: Based on data from spring 2013, spring 2014, and spring 2015; students took all four tests.

### Student Growth Percentiles

With average gain scores, growth expectations are the same for all students, regardless of their starting point. SGPs, on the other hand, describe growth relative to other students who had the same prior test scores (sometimes called “prior-year score history”).

Therefore, an SGP can be used to assess whether a student has demonstrated a year’s worth of growth compared to his or her academic peers. ACT Aspire reports an SGP for each subject area. Students with an SGP of 50 have approximately the same amount of growth as the average among their academic peers. Students with an SGP greater than 50 grew more in a year, and students with an SGP less than 50 grew less, than their academic peers. ACT Aspire classifies growth as *low* if the SGP is less than 25, *average* if the SGP is between 25 and 75, and *high* if the SGP is greater than 75 (see Figure 1).

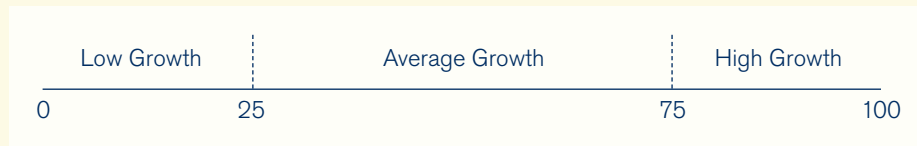


Figure 1. ACT Aspire student growth percentile descriptors

### Is my student making sufficient progress toward college readiness?

A student’s ACT Aspire report includes a graph in which the ACT Readiness Benchmarks are shown from grades 3 to 10, and the student’s score is plotted against the ACT Readiness Benchmark for the student’s current grade.<sup>5</sup> Students who are at or above the ACT Readiness Benchmark (putting them at the *Ready* level) are on target to meet the ACT College Readiness Benchmarks on the ACT in grade 11. The graph from a score report in Figure 2 shows the student is not quite meeting the ACT Readiness Benchmark for fifth-grade mathematics (at the *Close* level).

The score report also predicts the student’s score range two years out. In the student report shown in Figure 2, the predicted score path represented by the orange triangle indicates that it is possible, but not highly likely, that the student will meet the ACT Readiness Benchmark for mathematics in seventh grade, assuming typical growth.

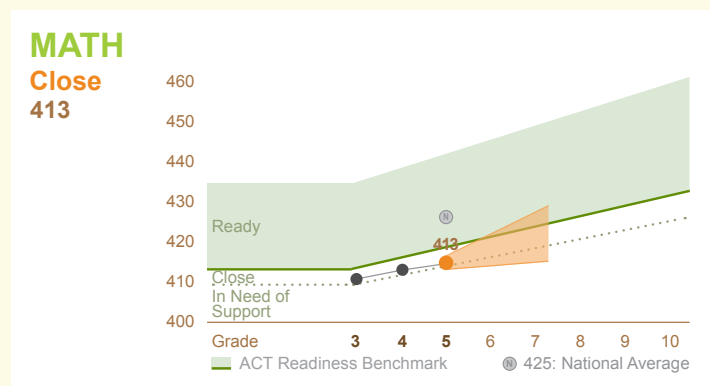


Figure 2. ACT Aspire sample fifth-grade student report

## Is my student demonstrating as much growth in one subject as in another?

The SGP for each subject area can provide information on whether a student is growing more in one subject than another. For instance, a student with an SGP of 50 in mathematics, 20 in English, 30 in reading, and 80 in science is demonstrating average growth in mathematics, higher growth in science, and lower growth in English and reading compared to her academic peers.

## Conclusion

Parents (as well as teachers and administrators) care about more than how students perform in a single year. Knowing how much students have learned from one grade to the next and how much they can be expected to learn in the future is valuable information. The growth models used as part of ACT Aspire reporting are powerful tools parents can use to understand and monitor their students' academic progress over time. ■

## Notes

- 1 Robert L. Smith and Wendy M. Yen, "Models for Evaluating Grade-to-Grade Growth," in *Longitudinal and Value-Added Modeling of Student Performance*, ed. R. W. Lissitz (Maple Grove, MN: JAM Press, 2006), 82–94.
  - 2 For a description of each type of growth model, see Katherine E. Castellano and Andrew D. Ho, *A Practitioner's Guide to Growth Models* (Washington, DC: Council of Chief State School Officers, 2013), <http://www.ccsso.org/Documents/2013GrowthModels.pdf>.
  - 3 More detail about the methodology used to calculate the student growth measures can be found in the ACT Aspire Technical Bulletin #2.
  - 4 The ACT Readiness Benchmarks also help to support *growth-to-standards* models that determine if students are making sufficient progress toward a performance standard (such as the ACT Readiness Benchmarks that are part of ACT Aspire). In the graph below, the growth-to-standards model is applied to a fictitious fourth-grade student (John) who took ACT Aspire in grades 3 and 4.
- John's score is below the fourth-grade ACT Readiness Benchmark in mathematics, and his goal is to become on target for college readiness by seventh grade. At each future grade level, one can determine if he is growing enough to reach his goal. The ACT Readiness Benchmarks for each grade level are represented by the points on the red line, John's scores are represented by the solid black squares, and John's goals are represented by the dashed black line. The ACT College Readiness Benchmark for mathematics is 22 and is represented by the black X. The seventh-grade ACT Readiness Benchmark for mathematics is 422. John's fourth-grade score was 411, so he needs to gain 11 score points over three years. If he gains 4 score points each year, he will meet his seventh-grade goal.
- 5 ACT Aspire score reports plot student scores against the grade at which the student tested, which could be different than the grade level at which the student is enrolled. ACT Aspire offers grade-level tests for grades 3–8, as well as early high school tests for grades 9 and 10.

