

Growth

Special Note

When using data to measure student outcomes, it is important that any determination is based on multiple pieces of data. Although this support document focuses on growth, it should be coupled with proficiency, student attendance, student's on-going benchmark results, and their social and emotional learning to fully evaluate student outcomes.

Student Growth Percentiles

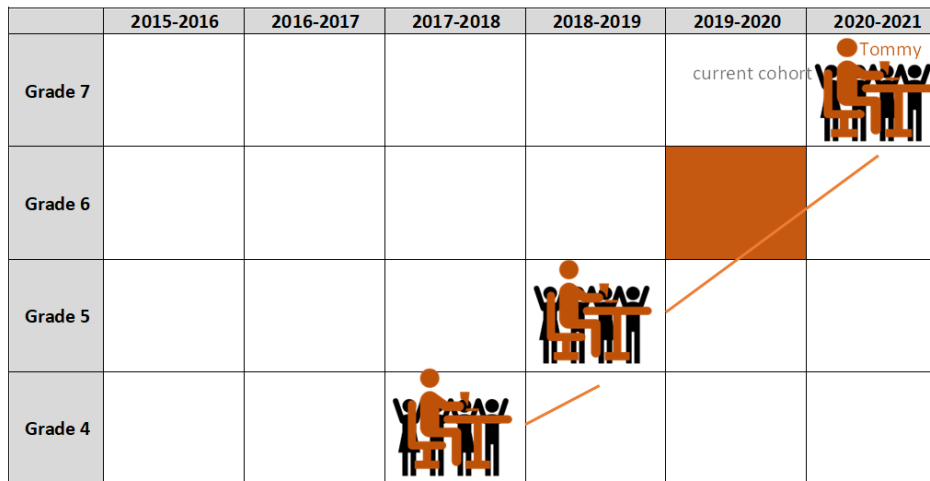
Arizona utilizes the Student Growth Percentile (SGP) model to assess students' academic growth (Betebenner, 2011). A Student Growth Percentile describes the relative growth of a student based on their current year test score compared with the current year test scores of those students with the exact same prior test scores – their academic peers. In this sense, an SGP is a “norm-referenced quantification” of student academic growth (Betebenner, 2011, p. 3). An SGP of 40 means that the student grew more than 40% of their academic peers in the time period considered in a given grade and content area. This growth model includes only academic achievement data, and it does not adjust for student demographic information or subgroup membership. If you would like to learn more about Student Growth Percentiles, Dr. Damian Betebenner has published several articles that can be found in research journals (Betebenner, 2008, 2009, 2011, 2012).

Skip-Year Growth Model Identified as Current-Year Cohort Referenced (SGP-CCR)

The SGP model usually assesses academic growth over one school year by employing quantile regression that links current-year scores with the scores from the immediate prior year(s). Due to cancellations of statewide assessments in Spring of 2020, the growth for the 2020-2021 school year will be calculated linking the 2018-2019 school year data (and prior year data if available in 2017-2018) to the 2020-2021 school year data. This is the academic growth over a period of two school years. Though not the most typical way of calculating growth, skip-year growth is calculated frequently in numerous states. For example, several states assess in grades 3 to 8 and 10. Skip year growth is calculated from grades 8 to 10. The skip-year methodology has been modeled and validated through historical data, consultation with experts, and review of available literature.

In this skip-year SGP Model, a student's test records in the 2020-2021 school year will be linked to their test records in the 2018-2019 school year as well as their test records in the 2017-2018 school year. A student must have scores for the 2020-2021 school year as well as for the 2018-2019 school year to receive an SGP, but student cohorts will be built by using the historic data from the 2018-2019 school year as well as the 2017-2018 school year if available. For example, to calculate the SGP for a student in Grade 5 from the 2020-2021 school year, her test records in Grade 5 in the current year will be linked to her test records in Grade 3 from the 2018-2019 school year. And to calculate the SGP for a student in Grade 8 in the 2020-2021 school year, his test records in Grade 8 in the current year will be linked to his test records in Grade 6 from the 2018-2019 school year as well as to the ones in Grade 5 from the 2017-2018 school year. In this skip-year SGP model, Grade 5 is the first possible opportunity to assess growth

for a student. Students in grades 3 and 4 will not have an SGP as they do not have test records from the 2018-2019 school year.

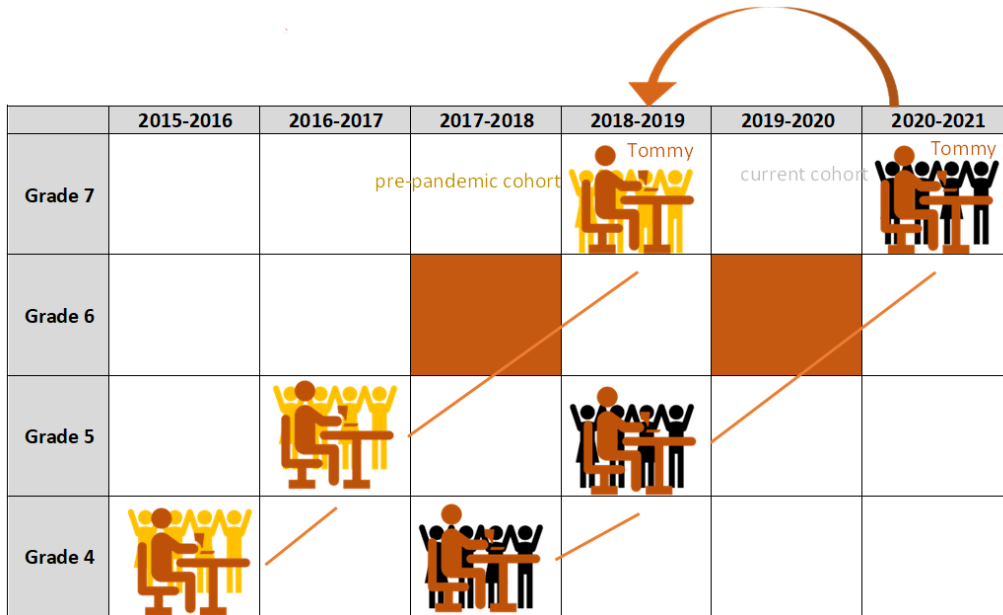


Note: In this graph, the current-year cohort is the students who were enrolled and tested in grade 7 in the 2020-2021 school year and who had a test score in grade 5 from the 2018-2019 school year and a test score in grade 4 from the 2017-2018 school year. Tommy is a student in this cohort. His current-cohort referenced skip-year SGP (SGP_CCR) is the SGP when he is compared to the students in this current-year cohort.

Pre-Pandemic-Cohort Referenced Skip-Year SGP (SGP_PPCRG)

As explained previously, students in the 2020-2021 school year can be compared with the students in the same grade in the same year with the same academic history in the 2018-2019 school year and in the 2017-2018 school year if available. This approach is called the current-cohort referenced skip-year SGP (SGP_CCR). They can also be compared to the students in the same grade in the 2018-2019 school year with the same academic history in the 2016-2017 school year, and in the 2015-2016 school year if available. This approach is called the pre-pandemic-cohort referenced skip-year SGP (SGP_PPCRG), as the 2018-2019 school year is the last year before the pandemic when the state assessment was administered.

Figure 2 illustrates how the current-cohort referenced skip-year SGP (SGP_CCR) and the pre-pandemic-cohort referenced skip-year SGP (SGP_PPCRG) can be calculated for a student in grade 7 in the 2020-2021 school year. This student's grade/year progression is grade 7/2020-2021, grade 5/2019-2018, and grade 4/2018-2017. He/She will be compared to the academic peers in the current cohort with the same grade/year progression and with the same academic history in the 2018-2019 school year and the 2017-2018 school year if available. This SGP is the current-cohort referenced skip-year SGP (SGP_CCR). A current-cohort referenced skip-year SGP of 60 means the student grew more than 60% of his/her academic peers in their current cohort during this period of two school years. He/She will also be compared to the pre-pandemic peers with a grade/year progression as grade 7/2018-2019, grade 5/2016-2017, and grade 4/2015-2016 and with the same academic history in the 2016-2017 school year and the 2015-2016 school year if available. This SGP is the pre-pandemic-cohort referenced skip-year SGP (SGP_PPCRG). A pre-pandemic-cohort referenced SGP of 60 means the student grew more than 60% of their academic peers in the pre-pandemic cohort in this period of two school years. Interested readers can find detailed descriptions of these two approaches in Betebenner et al. (2014) and Shear (2020).



Note: In this graph, the current-year cohort is the students who were enrolled and tested in grade 7 in the 2020-2021 school year and who had a test score in grade 5 from the 2018-2019 school year and a test score in grade 4 from the 2017-2018 school year. The pre-pandemic cohort is the students who were enrolled and tested in grade 7 in the 2018-2019 school year and who had a test score in grade 5 from the 2016-2017 school year and a test score in grade 4 from the 2015-2016 school year. Tommy is a student in the current-year cohort. His pre-pandemic-cohort referenced skip-year SGP (SGP_PPCRG) is the SGP when he is compared to the students in the pre-pandemic cohort.

Questions a school/district/charter holder can investigate with the SGP_PPCRG measurement when considering student results found in the final static file:

| Student(s) |
|--|
| <ul style="list-style-type: none"> • What students have an SGP-PPCRG of less than 33 or an SGP_PPCRG_Category of a 1? <ul style="list-style-type: none"> ○ Do these students have other data pieces showing them at-risk, or impacted by the pandemic? <ul style="list-style-type: none"> ▪ Knowing the recovery may take multiple years, what plan is in place to accelerate these students? • What students have an SGP_PPCRG of 33-66 or an SGP_PPCRG_Category of a 2? <ul style="list-style-type: none"> ○ Do other pieces of data show the student on par with other students, accelerating, or falling farther behind? <ul style="list-style-type: none"> ▪ Students should continue to be monitored that they are staying on track and gaining any losses. • What students have an SGP_PPCRG of above 66 or an SGP_PPCRG_Category of a 3? <ul style="list-style-type: none"> ○ Do other pieces of this data continue to show the student accelerating and learning ahead of their peers? <ul style="list-style-type: none"> ▪ These students may need to be reviewed for the traits they have that may be shared with others to make them more resilient. ▪ Students will still need to be monitored but hold less worry than the first two groups. |

CAUTION AND MISUSE of SGPs at the Student Level

The students' SGP-CCR and their SGP-PPCRG should not be compared against one another at a student level. At the student level, these are not relevant because growth, in general, is uncorrelated from year to year.

COVID-Impact Reporting

This pre-pandemic-cohort referenced approach gives Arizona an opportunity to assess the impact of the pandemic on students' academic growth. The growth score of a school in the 2020-2021 school year can be an aggregation of the current-cohort referenced SGPs (*SGP-CCR*). It can also be an aggregation of the pre-pandemic-cohort referenced SGPs (*SGP_PPCRG*). The pre-pandemic-cohort referenced growth score of a school in the 2020-2021 school year can be compared to the current-cohort referenced growth score of the same school in the 2018-2019 school year. A substantial difference could be indication of the impact of the pandemic as the two are compared to the same student cohort in the 2018-2019 school year. Following this rationale, we can identify not only the schools, but also the districts, the counties, or the subgroups of students that were negatively impacted by the pandemic and then direct extra support to them.

Detailed information at the various levels will be presented to the Arizona State Board of Education at both the September and October meetings with some of the findings being used in Governor Ducey's Executive Order (EO) 2021-03. Please feel free to watch the presentation live or later through the Arizona State Board of Education YouTube Channel found here:

<https://www.youtube.com/channel/UCsNwAaD9tyciKskyp0R2e5A>

References:

Betebenner, D. W. (2008). Toward a normative understanding of student growth. In K. E. Ryan & L. A. Shepard (Eds.), *The Future of Test Based Accountability* (pp. 155-170). New York: Routledge.

Betebenner, D. W. (2009). Norm- and criterion-referenced student growth. *Educational Measurement: Issues and Practice*, 28(4):42-51.

Betebenner, D. W. (2011). A Technical Overview of the Student Growth Percentile Methodology; Student Growth Percentiles and Percentile Growth Projections/Trajectories, The National Center for the Improvement of Educational Assessments, Dover New Hampshire.

Betebenner, D. W. (2012). Growth, standards, and accountability. In G. J. Cizek, *Setting Performance Standards: Foundations, Methods & Innovations. 2nd Edition* (pp. 439-450). New York: Routledge.