

A Guide to Understanding and Interpreting Outcomes from the Georgia Student Growth Model

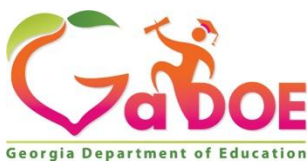


Table of Contents

Purpose.....	3
Introduction to the Georgia Student Growth Model	3
Student Growth Percentiles	3
Interpreting SGPs.....	4
Academically-Similar Student Cohort.....	4
Prior Scores.....	5
Calculating Student Growth Percentiles	6
Other SGP Calculation Details.....	6
Other Growth Outcomes	7
Growth Levels.....	7
Growth Targets.....	8
Where to Find Growth Results	8
Frequently Asked Questions	8
Does the GSGM use vertically scaled assessments to calculate and report growth?	8
Does the GSGM adjust for student demographic characteristics?.....	9
Is the GSGM a value-added growth model?.....	9
How many students does the GSGM require to create an academic cohort group?	9
How is growth calculated for 8 th grade students who participate in both EOG and EOC assessments?	9
How should growth scores be summarized at a system, school, or class level?.....	9

Purpose

This guide is designed to assist stakeholders in understanding and interpreting the growth measures provided by the Georgia Student Growth Model (GSGM). It details the methodology used to calculate growth, the results provided, and how results can be used to improve educational programs and outcomes. This guide is organized into four sections:

- Introduction to the Georgia Student Growth Model
- Student Growth Percentiles
- Other Growth Outcomes
- Where to Find Growth Results
- Frequently Asked Questions

Introduction to the Georgia Student Growth Model

The Georgia Student Growth Model provides various stakeholders, including students, parents, educators, and the public with information on student growth. Considering student growth (progress) in addition to student achievement (proficiency) provides a more complete picture of the academic performance of Georgia students. Achievement tells us where students are and growth tells us what it took for them to get there. With this information students, parents, and teachers can set realistic academic goals for meeting or surpassing grade-level proficiency standards, and schools and districts can improve educational programs. These are the primary reasons Georgia calculates and reports student growth information.

Growth outcomes are produced for students taking the Georgia Milestones assessments in grades 4-8 and high school in English language arts (ELA) and mathematics. To receive a growth score, students must have at least one prior score and a current score in the same content area. Student achievement and growth scores are reported with the Georgia Milestones End-of-Grade (EOG) and End-of-Course (EOC) assessment results at the end of the school year.

Growth information is also used in Georgia's school and district accountability system. Growth is used as a measure of student progress in the College and Career Ready Performance Index (CCRPI) and is reported alongside other measures to provide an overall indication of school and district effectiveness. Growth is also one of multiple measures used to provide an indication of teacher and leader effectiveness in the Teacher and Leader Keys Effectiveness Systems (TKES and LKES). Please see the [Accountability](#) and [Educator Performance](#) pages for more information on the procedures used by these offices.

Student Growth Percentiles

The GSGM uses the Student Growth Percentile (SGP) methodology to define and calculate student growth. The SGP methodology models the relationship between prior and current achievement by applying statistical procedures to student data. During these calculations, growth norm tables are produced for various cohorts of academically-similar students, and these tables are used to report student growth

percentiles. SGPs reflect the amount of growth students demonstrate from the prior year to the current year relative to academically-similar students across Georgia. Although students' academic cohort groups are defined based on prior test scores, SGPs are not. The calculations for student growth percentiles ensure that all students, regardless of their prior achievement level, can demonstrate all levels of growth. These calculations are discussed in a later section of this guide.

Interpreting SGPs

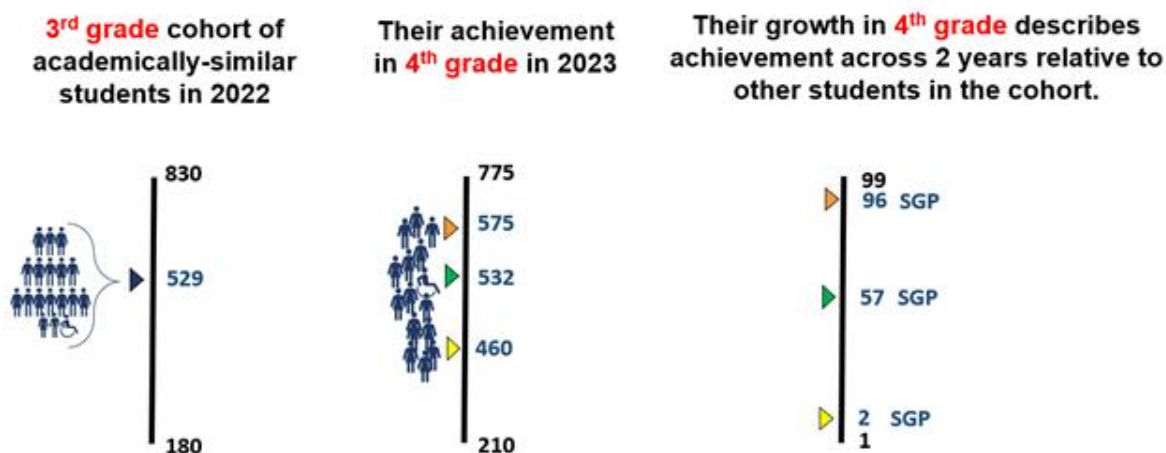
SGPs range from 1 to 99, with lower percentiles indicating lower academic growth and higher percentiles indicating higher academic growth. Like pediatric charts that are used to compare a child's physical growth to other children at the same age, SGPs are interpreted as percentile ranks comparing their current achievement to the achievement of other students who performed like them on the prior assessment. For example, a student with an SGP of 75 grew equal to or more than 75% of students with the same academic history.

By measuring growth relative to academically-similar students, SGPs provide an apples-to-apples comparison. A student's growth is relative to that of their academic cohort. This means that high-achieving students are being compared to other high-achieving students and low-achieving students are being compared to other low-achieving students. Expressing academic growth in terms of percentiles is informative because it provides perspective on typical year-to-year growth in English language arts and mathematics for Georgia students.

Academically-Similar Student Cohort

Understanding the comparison group is essential for interpreting SGPs. The comparison group, or cohort, consists of students across the state in the same grade (or course for EOC assessments) who earned the same achievement on the prior Georgia Milestones assessment. In the SGP analysis, many different cohorts are created, as many as there are combinations of prior scores. Figure 1 provides an illustration describing this concept.

Figure 1: Illustration of Academically-Similar Student Cohorts and SGP Interpretation



The left column shows a 3rd grade cohort of academically-similar students. These students earned the same score on the assessment in 2022. The middle column shows the various scale scores these students earned on their 4th grade assessment in 2023. Students' 4th grade achievement can be described in terms of the growth they made from the 3rd grade to 4th grade *relative to the growth made by the other students in their 3rd grade cohort*. SGPs describe this growth. In the middle column, achievement scores for three students are shown, and in the right column, the SGPs for these three students are shown. The yellow student earned a score of 460 in 2023, and this growth from 3rd grade to 4th grade relative to academically-similar students corresponds to an SGP of 2. This means that from the 3rd grade to the 4th grade, the yellow student grew the same or more than 2 percent of academically-similar students. The green student earned a score of 532 in 2023, which corresponds to an SGP of 57. The green student grew the same or more than 57 percent of academically-similar students. The orange student earned a score of 575 in 2023, which corresponds to an SGP of 96. The orange student grew the same or more than 96 percent of academically-similar students.

Prior Scores

A student's prior scores, sometimes called priors for short, are the historical assessment scores that are used to define their academic cohort in the SGP calculation. In Georgia's SGP calculation procedures, at least one immediate consecutive prior is required to produce a growth percentile, and up to two immediate consecutive priors may be used. For example, an 8th grade student may have their 7th and 6th grade assessment scores as priors, but they must have a 7th grade assessment score as a prior. Because one prior is required to produce growth percentiles, students who do not have a prior score, including students new to Georgia, will not receive a growth percentile. Similarly, even though there is a 3rd grade Georgia Milestones assessment, 3rd grade students will not receive growth percentiles because they do not have a 2nd grade prior score.

Prior scores for high school students who take End-of-Course assessments (EOCs) depend on the test sequence and the year the tests are taken. SGPs are produced for

all course and timing sequences where enough students are included to model growth reliably. This includes sequences for students who repeat courses or take them on a block schedule. For uncommon course sequences with small numbers of students statewide, growth percentiles are not provided. Also, SGPs are not calculated for students who take EOCs for the purposes of credit validation, test out, or retest.

Calculating Student Growth Percentiles

SGPs are statistical, regression-based quantities used to characterize the growth of students on state-mandated assessments. SGP calculations utilize quantile regression with b-spline smoothing to create growth norms that model the relationship between current and prior achievement scores across the achievement scale. Specifically, for each cohort of students taking the assessment in the same content area and grade, quantile regression is used to create 100 conditional percentiles for each student based on their prior and current scale scores. B-spline smoothing models any non-linearity in the distribution of scores, particularly at the high and low end of the assessment scale.

The growth norms derived from these calculation steps are called coefficient matrices, and they are used to report each student's SGP. Coefficient matrices are like look-up tables that relate prior achievement to current achievement. Using these look-up tables, any achievement distribution for a combination of prior scores can be identified. Using the achievement distribution and the student's current score, the student's growth percentile is reported.

An important feature of Georgia's SGP methodology is that it is robust to scale transformations like those associated with changes in assessment systems or updates to achievement standards. This means that when a testing program changes its reporting scale (like is done when new content and achievement standards are introduced), SGPs can still be calculated. However, reliable and valid SGP results require large representative samples of the population for each cohort. If assessment data are limited, for example during the years following the COVID-19 pandemic, SGP results may be unreliable and invalid. Each year, the technical quality of SGP results is evaluated to ensure that calculated SGPs are valid, reliable, and interpretable representations of student growth. In circumstances where the technical quality is found to be insufficient, student SGPs are not reported. Several technical [documents](#) for the GSGM are available, including the Georgia Milestones technical report, which provide information on how SGPs are calculated and evaluated.

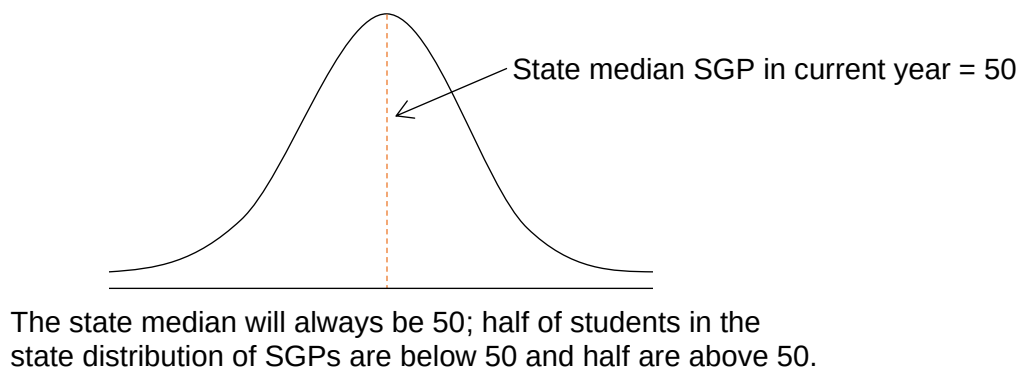
Other SGP Calculation Details

Cohort-Referenced Growth Percentiles

The GSGM produces cohort-referenced SGPs, which means that the calculation steps mentioned above are completed annually using the most current statewide achievement scores. Cohort-referenced student growth percentiles describe a student's growth relative to academically-similar students in the state in the current year. With cohort-referenced SGPs, student growth is interpreted relative to the state's growth distribution,

which has a median of 50. Figure 2 illustrates the cohort-references SGP distribution for each year.

Figure 2: Cohort-Referenced SGP Distribution



For more information, refer to the document titled *A Technical Overview of the Student Growth Percentile Methodology* located on the [Technical Reports page in Inspire](#).

Handling of Missing Data

Another SGP calculation detail is that Georgia does not impute or estimate missing student prior scores. If a student does not have at least one immediate consecutive prior score, a growth percentile is not produced for them. Further, if a student's current and prior scores cannot be matched by their test record identifier (i.e., GTID) in the assessment files, a growth percentile is not produced for them.

Other Growth Outcomes

In addition to SGPs, the GSGM provides two other pieces of information to support SGP interpretation and use. Student growth levels and growth targets are described below.

Growth Levels

Much like achievement levels are used to provide context to Georgia Milestones scale scores, student growth levels provide context for SGPs. Growth levels classify SGPs into three reporting categories as listed below:

- Low Growth: SGPs ranging from 1-34
- Typical Growth: SGPs ranging from 35-65
- High Growth: SGPs ranging from 66-99

These growth levels were set using past information about the relationship between student achievement and growth. A student who demonstrates low growth generally will struggle to maintain his or her current level of achievement. A student who demonstrates typical growth generally will maintain or improve academically. A student who demonstrates high growth generally will make greater improvements academically. However, it is important to remember that demonstrating low growth does not mean a student is low achieving. High-achieving students would demonstrate low growth if they scored lower on the assessment compared to other high-achieving students in their

academic cohort. Therefore, it is necessary to consider both achievement and growth when formulating goals and determining next steps.

Growth Targets

In addition to describing student growth from the prior year to the current year, the GSGM provides information about growth trajectories. Student growth targets are reported with the SGP for EOG grades and provide a criterion-referenced projection about the student's future test performance. That is, growth targets estimate the level of growth a student would likely need during the following school year to reach the next higher achievement level on the next test. Because they refer to future achievement, growth targets can help students, teachers, and parents set appropriate goals for the next school year. Like SGPs, growth targets range from 1 to 99. Because there are no Georgia Milestones assessments mandated after the high school EOC assessments, no growth targets are provided for high school students. For more information on interpreting and using growth targets, refer to the *Understanding Student Growth Targets* document located on the GSGM [page in Inspire](#) under Resources.

Where to Find Growth Results

Students and parents/guardians receive growth results along with the Georgia Milestones End-of-Grade (EOG) and End-of-Course (EOC) achievement results at the end of the school year. They can work with their teachers to better understand their academic standing and develop support or enrichment opportunities for the next year.

District leaders can access student-level growth results from the assessment data files that are provided at the end of the testing windows via the MyGaDOE Portal or the test vendor's assessment reporting system. Teachers and other educators have access to detailed SGP data for their students through the Statewide Longitudinal Data System (SLDS), where SGP data are displayed in the growth model visualization tool. Here they can utilize SGPs, in addition to other information about students, to improve student learning, instruction, and educational programs. Note that SGP data are cleaned and matched to student record information prior to being loaded into the SLDS, which require extra steps and time. SGP data are typically available in SLDS around late September of each year.

The public can access school- and district-level SGP results through a public version of the SGP data visualization tool located on [Georgia Insights](#).

Frequently Asked Questions

In this section, some frequently asked questions are answered.

Does the GSGM use vertically scaled assessments to calculate and report growth?

Vertically or developmentally scaled assessments are those that report student achievement for a content area on a single continuous scale that spans across grades. The Georgia Milestones assessment system does not use vertical scales, therefore, the

GSGM does not use vertical scales to report growth. The GSGM uses the SGP methodology, which does not require a vertically-scaled assessment system, to calculate and report growth. Note also that SGPs do not specify how many scale score points a student grew from year to year. Rather, SGPs describe growth in terms of how a student performed this year relative to other students who have a similar academic history.

Does the GSGM adjust for student demographic characteristics?

No. The GSGM does not adjust for student demographic characteristics such as race, gender, or poverty. The inclusion of demographic characteristics into the model would create different growth norm groups for each of the demographic subgroups, setting different growth expectations for those groups. In the same way that the state does not set different achievement expectations for students based upon their demographic characteristics, the state does not set different growth expectations for students. Excluding student demographic characteristics in the GSGM allows Georgia districts to investigate growth gaps between different demographic subgroups at the state, district, and school level, which adds an important dimension to the achievement gap discussion.

Is the GSGM a value-added growth model?

No. A growth model describes the change in student achievement across time. A growth model becomes a value-added model when observed growth is attributed to an entity (a teacher, a school, etc.). The GSGM does not attribute observed growth to an entity, it describes observed growth only.

How many students does the GSGM require to create an academic cohort group?

In the SGP calculation, data are used to establish a functional relationship between prior and current scores. For these relationships to be reliable, valid, and interpretable, large numbers of students in each academic cohort are required. Academic cohorts with less than 1,500 students statewide undergo additional technical quality checks to evaluate their technical quality prior to reporting. In most cases, these small cohorts are not reported.

How is growth calculated for 8th grade students who participate in both EOG and EOC assessments?

If enough students exist in these academic sequences, SGPs for 8th grade students participating in an ELA or Mathematics EOC assessment will be calculated using their 6th and 7th grade EOG scores as priors. These students will also receive a growth percentile for the ELA and Mathematics EOG assessments they take.

How should growth scores be summarized at a system, school, or class level?

There are several ways to meaningfully summarize the growth scores from the GSGM. Using the median SGP is the most common way growth information is summarized. A second method for summarizing growth is by calculating the average (mean) SGP. A

third method for summarizing growth is to calculate the percent of students in each growth level: percent of students demonstrating low growth, typical growth, and high growth. For more information, refer to the *Methods of Combining SGPs* document located on the GSGM [page in Inspire](#) under Resources.