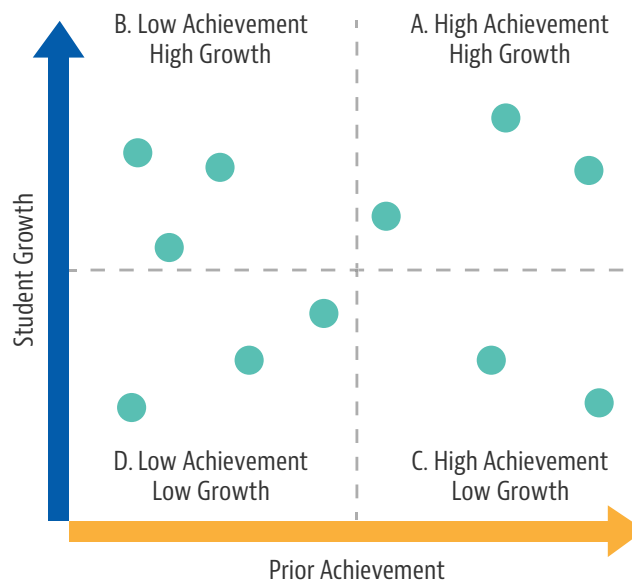


# How is the New York State Education Department Growth Model Produced for Teachers?<sup>1</sup>

Student growth is a measure of the progress a student makes during the school year as measured by standardized tests. This differs from student achievement, which provides a snapshot of a student’s academic understanding at a single point in time. Taken together, growth and achievement provide a more complete picture of a student’s current academic standing. Showing growth and achievement on the same diagram shows the relationship between the two concepts. Students in quadrant A experience high growth and high achievement. Students in quadrant D experience low growth and low achievement.

**Figure 1. Student Growth and Prior Achievement**



## How do we Measure Student Growth

The production of New York State Education Department’s teacher growth model begins at the student level. For each student, his or her expected performance on the grades 4–8 English language arts (ELA) and math State assessment is created using his or her actual assessment score, prior academic history, and individual and classroom characteristics. The comparison of the expected performance to the student’s actual performance generates a value of how much the student out- or under-performed the expectation. When the difference between actual performance and expected performance is positive, the student scored better than expected. When the difference is negative, the student scored worse than expected.

## Grades 4-8 Student Growth Percentile (SGP)

For all students in New York State, the difference between their actual and expected scores is used to create a percentile rank based on each student’s relationship to other students who took the same grade level and subject State assessment; this is also known as a student growth percentile (SGP). The larger the percentile rank, the more students a particular student out-performed. A simpler interpretation would be that a student with an SGP of 60 showed as much or more relative growth than 60% of students in the state with similar characteristics.

<sup>1</sup> New York State teachers of mathematics and English language arts (ELA) in grades 4–8 and receive State-provided growth scores based on 2018-19 State tests **for advisory purposes only** pursuant to Chapter 59 of the Laws of 2019, which amended the Student Performance Category requirements of Education Law §3012-d.



## From SGP to Mean Growth Percentile

Once the individual SGPs are computed for each student, the next step is to aggregate them into an individual teacher measure. Students must be enrolled in their course for at least 60% of the course duration ( $\frac{\text{Enrollment Duration}}{\text{Course Duration}} \geq 0.60$ ) to be included in their teacher's results.

For students that meet this requirement, their individual SGPs are weighted by the amount of time the students attended the course ( $\text{weight} = \frac{\text{Enrollment Duration}}{\text{Course Duration}} \times \frac{\text{Attendance Duration}}{\text{Enrollment Duration}}$ ) to calculate a mean growth percentile (MGP) for each grade/subject combination for each teacher. The grade and subject MGPs are combined using the number of students used in each grade/subject to create the overall MGP for each teacher.

For additional information about how student linkage and attribution is calculated for teachers, see the [Linkage Modular FAQ](#).

## From MGP to HEDI Ratings and Scores

To determine HEDI (i.e., Highly Effective, Effective, Developing, and Ineffective) ratings and scores, the MGPs for all teachers statewide are compared.

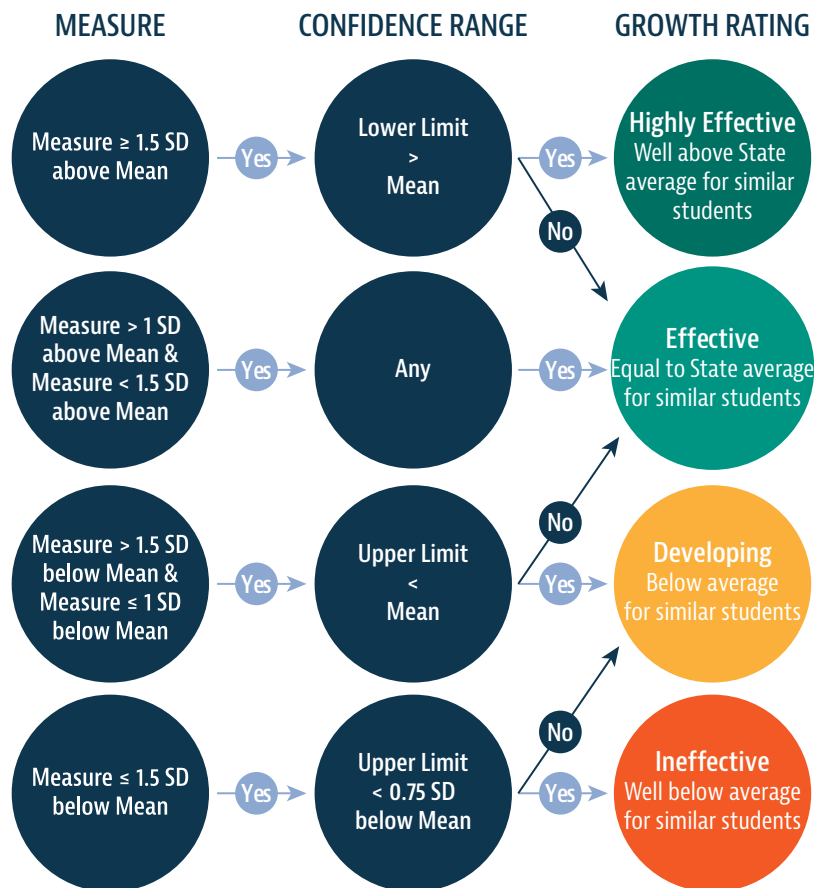
First, the HEDI rating is determined in two steps:

1. Determine where the teacher's MGP lies compared to all other teacher MGPs in the State.
2. Use the confidence interval of each teacher's MGP to determine his or her overall growth rating.

This two-step process is done because, as with all statistical calculations, there is some uncertainty associated with the SGP estimates. Although the reported MGP is the best estimate for any teacher, MGPs are also reported with an upper limit and a lower limit that represent the range of scores, or confidence interval, wherein an educator's true MGP lies 95 percent of the time. The width of the confidence interval is affected by such factors as the number of students included in generating the score, the spread of student scores, and the characteristics of tests students take. Figure 2 below shows how MGPs are assigned to HEDI ratings in this two-step process.



**Figure 2. HEDI Classification Diagram**



To illustrate the two-step process to determine the HEDI rating, consider the following four example teachers where the hypothetical mean MGP across all teachers is 51 and the standard deviation is 11 (see Table 1).<sup>2</sup>

**Table 1. Teacher Examples**

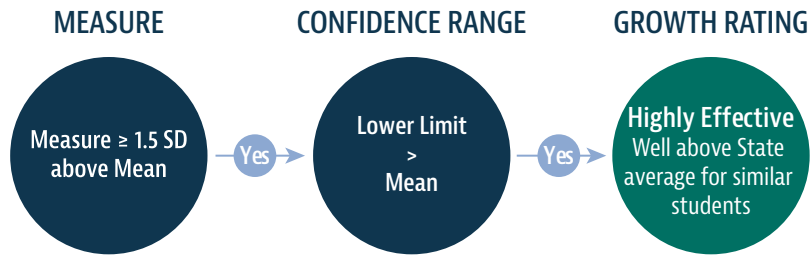
	MGP	Lower Limit	Upper Limit	HEDI Rating
Statewide	51	-	-	-
Teacher 1	70	65	76	Highly Effective
Teacher 2	70	48	88	Effective
Teacher 3	37	28	45	Developing
Teacher 4	33	29	40	Ineffective

Teacher 1 has an MGP of 70, which is more than 1.5 times the standard deviation above the mean MGP. The teacher’s confidence interval lower limit is 65, which is greater than the mean MGP, so Teacher 1 is assigned a Growth Rating of Highly Effective (see Figure 2.1).



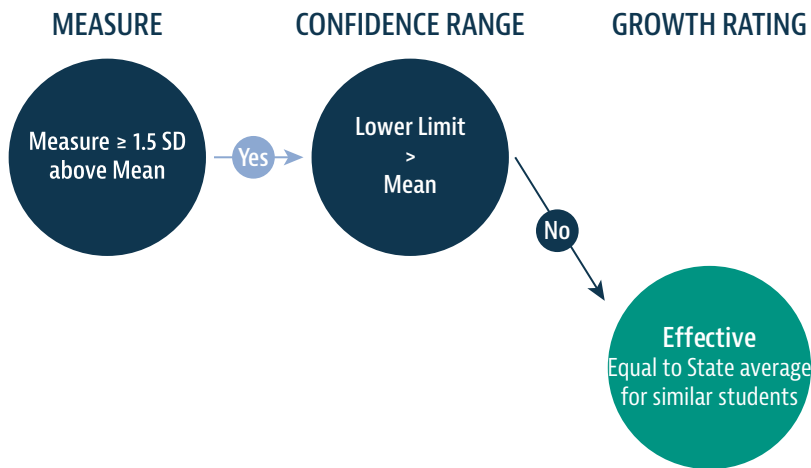
3 <sup>2</sup> A standard deviation is a measure of how much data deviates from the mean or average.

Figure 2.1 Teacher 1



Teacher 2 also has an MGP of 70, but in this case the teacher has a confidence interval lower limit of 48, which is less than the mean MGP.<sup>3</sup> As a result, Teacher 2 is assigned a Growth Rating of Effective (see Figure 2.2).

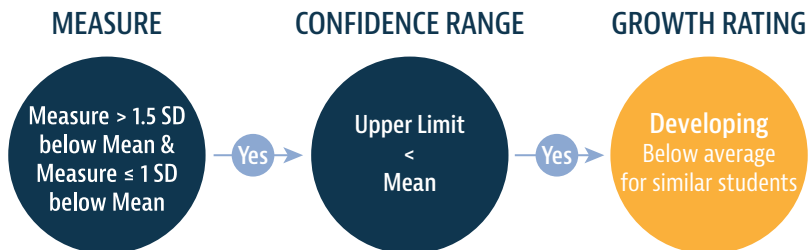
Figure 2.2 Teacher 2



Teacher 3 has an MGP of 37, which is more than 1 times the standard deviation below the State mean and less than 1.5 times the standard deviation below the State mean. Teacher 3 has a confidence interval upper limit of 45, which is less than the State mean, so the teacher is assigned a Growth Rating of Developing (see Figure 2.3). If the upper limit had been greater than 50, then Teacher 3 would have been assigned a Growth Rating of Effective.

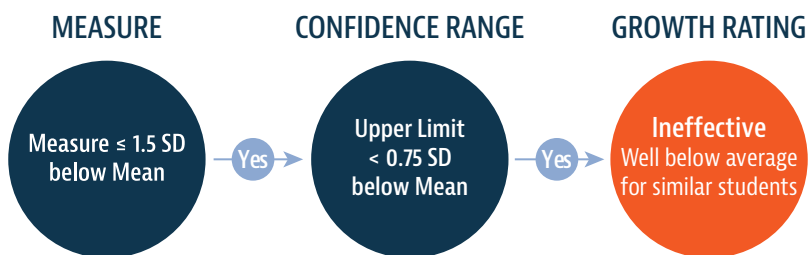
<sup>3</sup> As noted above, multiple factors impact the confidence interval lower and upper limits. For example, even though Teachers 1 and 2 have the same MGP, the smaller lower limit for Teacher 2 may be a result of having fewer attributed SGPs that vary widely between 1 and 99.

**Figure 2.3 Teacher 3**



Teacher 4 has an MGP of 33, which is more than 1.5 times the standard deviation below the mean of all teachers in the State. Teacher 4 has a confidence interval upper limit of 40 which is less than 0.75 times the standard deviation below the state mean, so the teacher is assigned a Growth Rating of Ineffective (see Figure 2.4). If upper limit had been greater than 42, then the teacher would have been assigned to the Developing category.

**Figure 2.4 Teacher 4**



After the growth ratings are determined, 0-20 points for the state provided growth scores are calculated based on a teacher’s Growth Rating (i.e., Highly Effective, Effective, Developing or Ineffective) and their MGP. Teachers MGPs for each Growth Rating are ranked and an even number of teachers are assigned to each HEDI Points category in that rating. As an example, if 300 educators were rated highly effective, then the 100 with the highest MGP would receive 20 HEDI points, the next 100 MGPs would receive 19 HEDI points, and the last 100 MGPs would receive 18 HEDI points. Table 2 shows the minimum and maximum teacher MGP for each HEDI point in 2018/19.<sup>4</sup>

<sup>4</sup> If there is a tie, teachers with the same MGP are assigned to the higher HEDI point value. As an example, consider the Highly Effective category. There are three HEDI point values associated with that category and, as a result, teachers in this category are assigned points such that the 33.3% teachers with the highest MGPs receive 20 points, those with the middle 33.3% MGPs receive 19 points, and those 33.3% with the lowest MGPs receive 18 points. Following the 2018/19 point classification table below, if teachers with an MGP of 74 points or higher made up 32% of teachers in the Highly Effective group and adding teachers with an MGP of 73 points would bring that share to 38%, teachers with an MGP of 73 points or higher would also receive 20 HEDI points.



**Table 2. 2018/19 HEDI Point Classification**

HEDI Rating	HEDI Points	Minimum MGP	Maximum MGP
Ineffective	0	9	22
Ineffective	1	23	24
Ineffective	2	25	25
Ineffective	3	26	26
Ineffective	4	27	27
Ineffective	5	28	28
Ineffective	6	29	29
Ineffective	7	30	30
Ineffective	8	31	31
Ineffective	9	32	32
Ineffective	10	33	33
Ineffective	11	34	34
Ineffective	12	35	35
Developing	13	28	37
Developing	14	38	40
Effective	15	36	47
Effective	16	48	54
Effective	17	55	68
Highly Effective	18	67	68
Highly Effective	19	69	72
Highly Effective	20	73	95

**Note:** Because the teacher’s confidence interval is used to determine the HEDI rating, an MGP may be associated with more than one HEDI point. For example, pending the confidence interval, a teacher with an MGP of 36 could be assigned to a HEDI score of 13 or 15.

