

Appendix E – Texas Growth Index

WHAT IS TGI

The Texas Growth Index (TGI) is an estimate of a student's academic growth on the TAKS tests, over two consecutive years (in consecutive grades).

For the state accountability system, it is used in two ways:

- to calculate Gold Performance Acknowledgments for Comparable Improvement in Reading/ELA and Mathematics; and
- to calculate the TAKS Progress Indicator under the alternative education accountability (AEA) procedures.

The parameters used to determine TGI (shown in the tables below) were developed using the empirical data from the base comparison years — spring 2003 to spring 2004.

CALCULATING TGI

The following steps are used to determine student-level TGI. Student growth is estimated as a line with an intercept (or starting point) and slope (or increase).

- Step 1: Find the starting point for an individual student in the row of the table below that matches that student's grade and subject.
- Step 2: Take the student's scale score in 2006.
- Step 3: Find the increase for that student in the row of the table below that matches that student's grade and subject.
- Step 4: Multiply the student's scale score from 2006 by the increase.
- Step 5: Add the amount from Step 1 and the total from Step 4. This is the expected student scale score for 2007.
- Step 6: Take the student's scale score from 2007 and subtract the expected student score from it. This number is the difference in expectation.
- Step 7: Calculate Adjusted TGI by dividing the result from Step 6 by the Adjustment factor shown on the tables below. Round to the second decimal place.
- Step 8: If the difference in expectation is positive, that student's performance grew more than expected. If the difference in expectation is negative, that student's performance grew less than expected.

A TGI of zero means that the year-to-year change in average scale score is equal to the average predicted change as calculated in the 2003 to 2004 base comparison years. A positive TGI means the group demonstrated growth that is larger than the expected growth for that group. A negative TGI indicates the group grew less than expected.

Table 35: TGI Growth Equation Parameters – Mathematics and Science

Growth Grades	Subject	Starting Point	Increase	Adjustment
3-4	Math	-3.38	1.006	138.07
3-4 (Spanish)	Math	-903.49	1.44	190.11
4-5	Math	-530.83	1.258	160.01
4-5 (Spanish)	Math	-32.22	1.03	160.29
5-6	Math	-167.96	1.085	152.94
5-6 (Spanish)	Math	-11.10	1.04	173.12
6-7	Math	612.26	0.705	95.40
7-8	Math	-544.89	1.269	118.89
8-9	Math	-775.75	1.378	136.19
9-10	Math	480.79	0.773	95.47
10-11	Math	-138.428	1.092	104.38
10-11	Science	410.23	0.832	75.94

Table 36: TGI Growth Equation Parameters – Reading, ELA, and Social Studies

Growth Grades	Subject	Starting Point	Increase	Adjustment
3-4	Reading	-12.89	0.993	135.97
3-4 (Spanish)	Reading	-158.07	1.03	158.44
4-5	Reading	-520.23	1.235	149.93
4-5 (Spanish)	Reading	-480.94	1.24	159.13
5-6	Reading	-66.29	1.066	151.85
5-6 (Spanish)	Reading	109.69	.99	143.36
6-7	Reading	372.28	0.827	126.53
7-8	Reading	-87.53	1.065	128.61
8-9	Reading	712.12	0.663	101.31
9-10	Reading/ELA	535.21	0.762	91.11
10-11	ELA	128.38	0.962	96.41
10-11	Social Studies	464.43	0.810	93.98

TGI growth equation parameters were calculated over the 2003 to 2004 base comparison years. These base calculations will be applied in measuring growth across subsequent years.

Table 37: Sample TGI Calculation

Suppose you wish to examine a student’s mathematics growth from Grade 10 to Grade 11. Suppose that student had a scale score of 2188 in Grade 10 and a scale score of 2161 in Grade 11.

	STEPS	EXAMPLE VALUES
Step 1	Find the starting point for that student in the row of the table that matches that student’s grade and subject.	-138.428
Step 2	Take the student’s scale score in the first year.	2188
Step 3	Find the increase for that student in the row of the table that matches that student’s grade and subject.	1.092
Step 4	Multiply student’s scale score from the first year by the increase.	$2188 \times 1.092 = 2389.296$
Step 5	Add the amount from Step 1 and the total from Step 4. This is the expected student scale score for the second year .	$-138.428 + 2389.296 = 2250.868$
Step 6	Take the student’s scale score from the second year and subtract the expected student score from it. This number is the difference in expectation .	$2161 - 2250.868 = -89.868$
Step 7	Calculate Adjusted TGI by dividing the result from Step 6 by the Adjustment factor shown on the tables below. Round to the second decimal place.	$-89.868 / 104.38 = -0.86$
Step 8	If the difference in expectation is positive, that student grew more than expected. If the difference in expectation is negative, that student grew less than expected.	Since -0.86 is negative, the student grew less than expected.

APPROPRIATE USE OF THE TEXAS GROWTH INDEX

The TGI was primarily designed for use in accountability. It was designed to be used at the campus and district level. It is not intended for use for individual students. In addition, the TGI is based on TAKS scale score changes between spring 2003 and spring 2004. The analyses establishing the TGI did not include retesting students. Therefore, it should not be calculated for students retesting on either the Exit TAKS or TAKS retest administrations at the SSI grades. Finally, the TGI was not designed to compare the growth of different classrooms within a school and therefore should not be used to evaluate teachers.

HOW TGI IS USED IN DETERMINING COMPARABLE IMPROVEMENT

Comparable Improvement (CI) is calculated separately for TAKS reading/ELA and TAKS mathematics. The student-level TGI values are aggregated to the campus level to create an average TGI for each campus.

Who is included:

Students included in a school's CI calculation are those who:

- took the spring 2007 TAKS reading/ELA and/or mathematics tests, in grades 4 - 11
- are part of the 2007 *Accountability Subset* (see *Chapter 2 – The Basics: Base Indicators*);
- can be matched to the spring 2006 TAKS administration—anywhere in the state—to find their prior year TAKS performance for reading/ELA, and/or mathematics; and,
- have been promoted to one higher grade than in 2006.

Calculating Average TGI:

$$\text{average TGI(reading/ELA)} = \frac{\text{sum of individual student TGI values for reading/ELA}}{\text{total number of students with TGI in reading/ELA}}$$

$$\text{average TGI(mathematics)} = \frac{\text{sum of individual student TGI values for mathematics}}{\text{total number of students with TGI in mathematics}}$$

Once the average TGI is determined, it is listed with the other 40 average TGIs of the school's comparison group. The schools are arranged from highest to lowest average TGI. If the target school falls in the top quartile and all other eligibility criteria are met, it is awarded a Gold Performance Acknowledgment for Comparable Improvement. This is calculated separately by subject.

Other information:

- *Retesters.* The analyses establishing the TGI did not include the retest administrations, that is, it is calculated from the first administration for grade 11 exit-level students, and for the first administration in the SSI grades — grade 3 reading and grade 5 reading and mathematics.
- *Quartile Size.* Because there are 40 schools in a comparison group, there are usually 10 schools in each quartile (with the target school being the 11th school in its quartile). Exceptions to this occur when a group has tied average TGI values at the border between quartiles, or when a school in a group has too few “matched students,” and is therefore not assigned an average TGI value or a quartile. This will cause the number of schools in each quartile to vary.
- *Quartile Rank.* High growth values do not necessarily imply that more students are passing the TAKS. It simply evaluates the performance growth of all students regardless of whether they passed or failed.
- *Quartile Position Across Subjects.* A school's quartile position can vary by subject. For instance, a school may be Q1 in reading, but it may be Q2 in mathematics. Quartile position is relative to the performance of the other schools in the group.

- *Quartile Position Across Groups.* A school may be Q1 for its own group and Q4 as a member of another school's group. (However, the quartile value evaluated for a particular school is the one determined for the school's own group.)
- *Minimum Size.* Any school with fewer than 10 matched students for a subject will not have average TGI values calculated and will not be assigned a quartile position.
- *Number of Matched Students.* The number of matched students for reading may differ from the number of matched students for mathematics.
- *TGI Uses.* The TGI is not intended for use with individual students, nor is it intended for comparing the growth of different classrooms within a school to evaluate teachers.
- *Negative TGI Values.* The TGI is a statistic with a mean of zero; negative values for students indicate the growth is less than expected. A negative TGI does not mean that performance of students declined from the prior year. Campuses with negative TGI values are not prohibited from earning CI acknowledgments.

For a more detailed explanation of *Gold Performance Acknowledgment*, see the *Chapter 5 – Gold Performance Acknowledgments*.

HOW TGI IS USED IN DETERMINING THE TAKS PROGRESS MEASURE

The TAKS Progress Measure is used in evaluating registered alternative education campuses (AECs). For an explanation of how TGI is used in the Progress Measure, see *Chapter 10 – AEA Base Measures*.

