

Science Performance Index Calculation Using Scores from NGSS-Aligned Assessments

Last Updated: February 2026

Individual student results from the Next Generation Science Standards (NGSS) assessment are reported in terms of scale scores and achievement levels. Results from the Connecticut Alternate Science (CTAS) assessment are reported using raw scores and achievement levels. Achievement levels unique to each test are used as a way of categorizing student performance in a content area. The levels represent broad groupings of performance that are developed based on the judgment of content experts. Operationally, the levels are used as a starting point in discussing a student’s test scores; the scale scores (NGSS) and raw scores (CTAS) are more precise measures of a student’s achievement on the performance continuum.

For district- and school-level accountability, Connecticut uses student scale scores and raw scores, not achievement levels, to calculate the Science Performance Index. This approach to performance index calculation acknowledges that the assessments were not developed solely to classify students into broad achievement levels. On the contrary, they were developed to provide a more precise measure of student performance. The index calculation is more sensitive to changes in student performance at the student group, school, and district levels.

The student performance index calculation uses a 0-110 scale. Important considerations in defining the index are that it: (a) provides an aggregate measure of science performance across grades; (b) allows for a more accurate comparison of subgroup, school, and district performance, not only within a year, but also across years; (c) encourages a focus on all students, not just those at the cusp of an achievement level; and (d) ensures that the expected index performance of 75 falls solidly in the desired achievement level (i.e., Level 3). Although the highest index value at the school, district, and subgroup level is 100, assigning scores ranging from 100 to 110 to students who are the highest performing has the effect of rewarding these schools and districts by weighting these scores additionally in the computation of the Science performance index.

Performance Index Calculations for the NGSS Assessment

To ensure that the expected index performance falls in the desired achievement level for the NGSS assessment, the individual student index is set to zero if a student obtains a score at or below the “low range” for the student’s grade, and 110 if the student obtains a score at or above the “high range.” The formula used to convert student scale scores from the NGSS assessment to an index value is presented below followed by a table of scale score ranges for the NGSS.

$$Index = \frac{Scale\ Score - Low\ Range\ Score}{Scale\ Score\ Range} * 110$$

Table 1.
Low and High Range Scale Scores and the Scale Score Range by Grade Level for the NGSS assessment.

Grade	Low Range Score	High Range Score	Scale Score Range
5	405	560	155
8	715	860	145
11	1030	1160	130

Example 1. If a Grade 5 student earns a scale score of 525 on the NGSS assessment, the index value for this score is

$$Index = \frac{Scale\ Score\ (525) - Low\ Range\ Score\ (405)}{Scale\ Score\ Range\ (155)} * 110 = \mathbf{85.2}.$$

Example 2. When a Grade 11 student earns a scale score of 1020 on the NGSS assessment, which is below the “low range” score of 1030 for that grade, the index value for that score is set to **0**.

Performance Index Calculations on the CTAS assessment

The performance index calculation for the CTAS assessment uses the lowest and highest possible raw scores; students cannot score outside of these ranges. The formula used to convert student raw scores from the CTAS assessment to an index value is presented below followed by a table of the lowest and highest obtainable scale scores for the CTAS.

$$Index = \frac{Raw\ Score - Lowest\ Possible\ Raw\ Score}{Score\ Range} * 110$$

Table 2.

Lowest and Highest Possible Raw Scores and the Score Range by Grade Level for the CTAS

Grade	Lowest Possible Raw Score	Highest Possible Raw Score	Score Range
5	0	88	88
8	0	84	84
11	0	84	84

Example 3. If a Grade 8 student earns a raw score of 54 on the CTAS assessment, the index value for this score is

$$Index = \frac{Raw\ Score\ (54) - Lowest\ Possible\ Raw\ Score\ (0)}{Score\ Range\ (84)} * 110 = \mathbf{70.7}.$$