

What is a stanine score? (Definition & Examples)

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The stanine score is a crucial measurement tool in educational and psychological assessment, providing a standardized, single-digit representation of an individual's performance on a standardized test. Derived from the phrase "standard nine," this scoring system collapses the entire range of raw scores into a simplified scale spanning from 1 to 9. This transformation is highly valuable for comparative analysis and efficient reporting.

It is based on a nine-point scale that effectively divides the entire distribution of test scores into nine distinct intervals. Stanine scores are particularly useful because they offer a quick, intuitive method for summarizing and comparing results from a wide variety of assessments, including the **SAT**, **ACT**, and various **Intelligence Quotient (IQ)** tests. In all cases, a higher score on the stanine scale consistently indicates a higher level of relative performance compared to the norm group.

Understanding the Stanine Score: Definition and Purpose

A **stanine score**, short for "standard nine" score, is a way to scale test scores on a nine-point standard scale. This system provides immediate contextual clarity, allowing administrators, educators, and test-takers to quickly grasp where an individual's achievement lies within a defined population. By normalizing complex score distributions, the stanine methodology ensures that results are comparable across different assessment instruments and testing cohorts.

Using this method, we can convert every test score from the original raw score range (which might be 0 to 100 or even thousands) to a normalized ordinal number precisely between 1 and 9. This compression into nine fixed intervals facilitates rapid communication of results and minimizes the confusion often associated with highly granular raw scores or complex percentiles.

How Stanine Scores are Calculated: A Two-Step Process

Converting a set of raw test scores into stanine scores involves a precise statistical transformation based on the principles of the normal curve. This is achieved through a simple, yet rigorous, two-step process to ensure the stanine scores accurately reflect the relative standing of the test-taker within the standardization group.

1. Rank All Scores: The first critical step involves establishing the relative rank of every individual score. All raw test scores must be meticulously ordered from the lowest score achieved to the highest score achieved. This ranking is essential because stanines are fundamentally measures of **relative standing**.

2. Assign Stanine based on Distribution: The second step involves assigning the stanine score based on specific, predefined percentages of the total score distribution, adhering strictly to the

normal curve proportions. The lowest 4% of scores are given a stanine score of 1, the next lowest 7% of scores receive a stanine score of 2, and so on, following the fixed percentages outlined in the table below:

Test Score	4%	7%	12%	17%	20%	17%	12%	7%	4%
Stanine	1	2	3	4	5	6	7	8	9

Interpreting Stanine Results and Performance Levels

Interpreting a stanine result is straightforward due to its structure, which divides the performance distribution into three major categories: below average, average, and above average. This clear division makes the stanine system an excellent diagnostic tool for identifying performance levels relative to the norm group.

In general, test scores are categorized and regarded as follows:

Stanines 1, 2, 3: Below Average. These scores represent performance in the lower third of the distribution, indicating results significantly below the statistical midpoint.

Stanines 4, 5, 6: Average. This range constitutes the large middle portion of the distribution, encompassing the bulk of all scores. Stanine 5 is the precise average.

Stanines 7, 8, 9: Above Average. These scores reflect strong performance relative to the peer group, placing the test-taker in the top third of the tested population.

The relationship between the stanine score and its equivalent percentile rank provides further clarity regarding the proportion of individuals scoring below a given stanine level, as shown here:

Test Score	4%	7%	12%	17%	20%	17%	12%	7%	4%
Stanine	1	2	3	4	5	6	7	8	9



Below average
Average
Above average

Statistical Properties of the Stanine Scale

The stanine scale is anchored by precise statistical properties derived from the normal distribution, allowing for robust comparisons. When scores are converted to stanines, the resulting distribution

is normalized with fixed statistical parameters, regardless of the original test's raw score characteristics.

It turns out that a stanine scale, by definition, has a statistical mean of five (5), which logically centers the distribution around Stanine 5, the largest category. Furthermore, the standard deviation of the stanine scale is fixed at two (2). This means that scores falling within the range of Stanines 3 through 7 effectively represent one standard deviation above and below the mean, capturing approximately 68% of the entire tested population.

Advantages and Disadvantages of Using Stanine Scores

Stanine scores offer the following distinct pros and cons regarding their use in educational and psychological measurement:

Pro: Quick Relative Understanding. Stanine scores allow us to gain a quick, actionable understanding of where a given test score lies relative to all other scores in the norm group. This compression filters out minor, often statistically insignificant, differences in raw scores. For example, we know that a student who receives a test score in **Stanine 5** belongs to the middle 20% of all test scores, representing average performance. Similarly, a student who falls in **Stanine 9** received a test score in the top 4% of all scores, signifying superior performance.

Con: Loss of Precision. The primary drawback of using stanines is that each stanine is not equally sized in terms of raw score units, and the broad grouping leads to a significant loss of precision. A test score in a given stanine could be statistically much closer to the scores in the adjacent stanine compared to scores within its own category. For example, students whose scores fall between the 40th through 60th percentile are all grouped together in Stanine 5. However, a student whose test score falls at the 58th percentile would be statistically closer to the scores received in Stanine 6 than to those at the 41st percentile within Stanine 5, yet they receive the same score.

Key Alternatives to Stanine Scores: Percentiles

While stanines offer simplicity, alternative scoring metrics provide greater detail. One common alternative is the percentile rank, which tells us the exact percentage of all scores that a given test score lies above. Percentiles offer granularity that stanines lack, making them valuable when fine distinctions are needed.

For example, a test score at the 90th percentile is higher than 90% of all test scores in the normative sample. Conversely, a test score that falls at the 50th percentile is precisely in the middle of all test scores. While percentiles are precise, they can sometimes distort the perception of score differences, particularly near the median, where small raw score changes result in large

percentile shifts.

Key Alternatives to Stanine Scores: Z-Scores

Another powerful statistical alternative is the z-score, or standard score, which quantifies the relationship between a score and the mean of the distribution in units of standard deviation. Z-scores are mathematically rigorous and are calculated using the following fundamental formula:

$$z = (X - \mu) / \sigma$$

where:

X is a single raw data value (the score in question)

μ (mu) is the mean of the dataset

σ (sigma) is the standard deviation of the dataset

We interpret z-scores based on their sign and magnitude:

A positive z-score indicates that a test score is *above* the mean.

A negative z-score indicates that a test score is *below* the mean.

A z-score equal to zero indicates a test score that is exactly *equal to* the mean.

The further away a z-score is from zero, the more exceptional the given test score is relative to the average performance. Both z-scores and percentiles give us a more precise, granular idea of where certain test scores rank compared to the broad classifications inherent in stanine scores.