

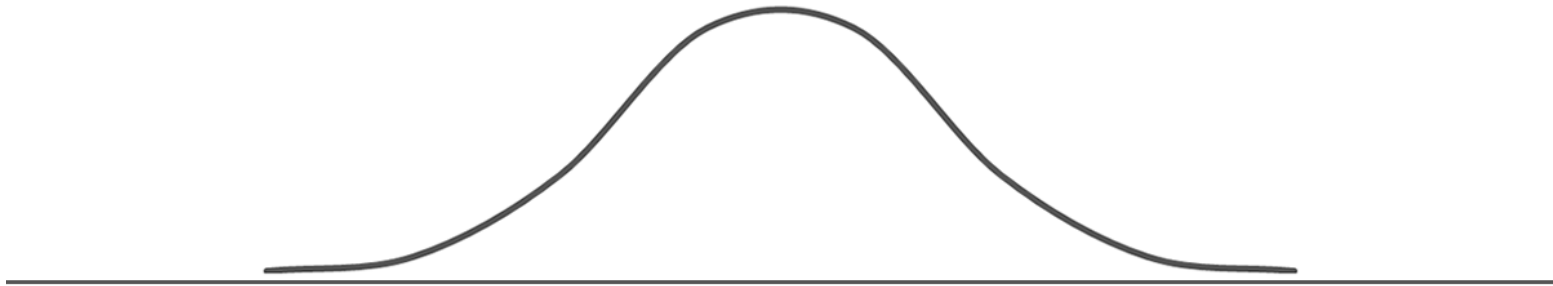
A close-up photograph of a woman and a young boy in a classroom. The woman, on the left, is looking towards the boy with a slight smile. The boy, on the right, is looking down, focused on something in his hands. The background is blurred, showing other students and classroom furniture.

RENAISSANCE LEARNING™

**Percentile ranks,
stanines and stens**

Normal distribution: the bell curve

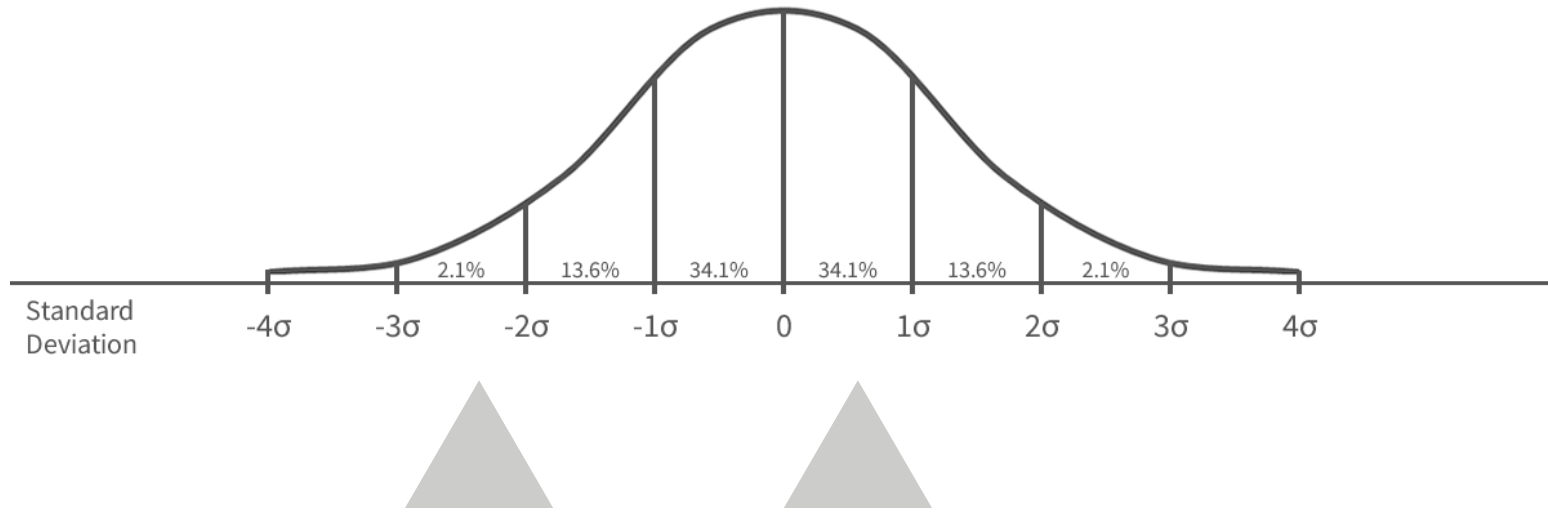
- Results from assessments are distributed unevenly.
- More students gain close to average results than very high or very low ones.
- When plotted on a graph using normal distribution, the shape of the graph resembles a bell curve.



Standard deviation in test results

- The standard deviation (σ) refers to the amount of variation there is from average.
- A plot of normal distribution has the average score at the centre, the highest point of the bell curve.
- A plot of normal distribution where each section represents 1σ shows that almost all the results fall within $\pm 3\sigma$ of the average.
- 64.2% of results fall within $\pm 1\sigma$ of the average.

Below average results Above average results

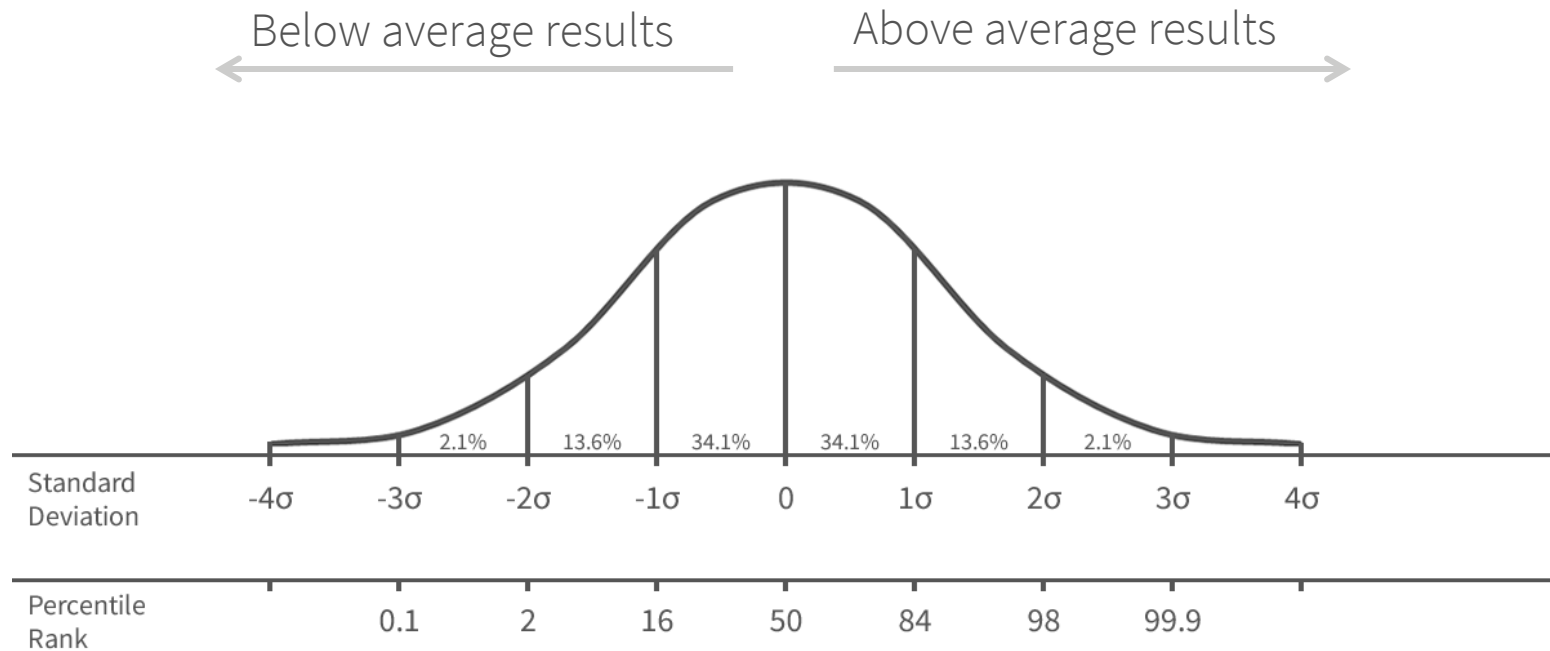


2.1% of results fall between
-2σ and -3σ of the average

34.1% of results fall within
1σ of the average

Percentile rank

- The percentile rank divides a score scale into 100 units.
- The percentile rank of a test score is the frequency with which scores are the same or lower than that percentile.
- As such, a result with a percentile rank of 84% means that 84% of students performed at or below that level, while 16% performed above that level.

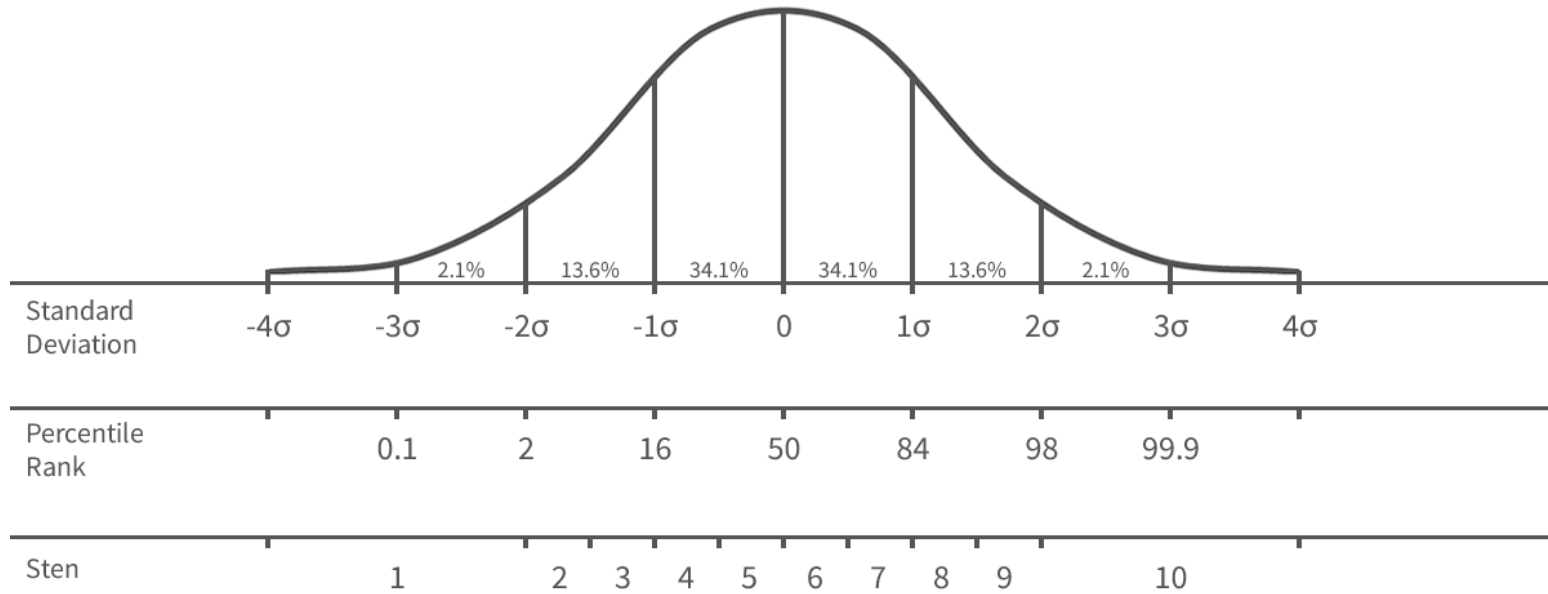


84% of those taking the test performed at or below this level

Stens

- The sten (standard ten) divides a score scale into ten units.
- Stens represent a range representing a certain number of standard deviations from the average.
- The average result lies on the border of the 5th and 6th stens (the mid-point).
- Stens 2, 3, 4, 5, 6, 7, 8 and 9 cover a range of 0.5σ each.
- Stens 1 and 10 cover all other results.

Below average results Above average results

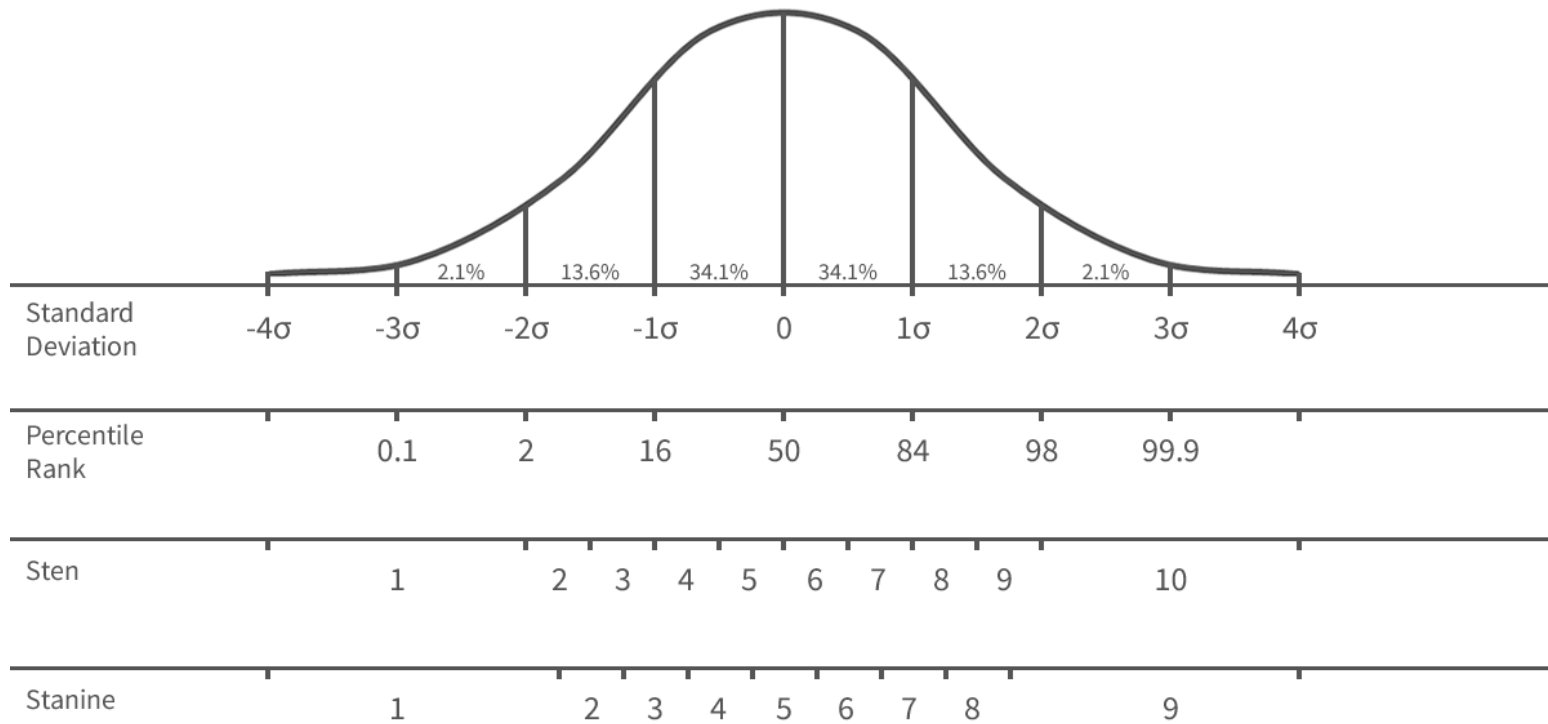


Results within 0.5σ of average have a sten score of 6. This applies to 19.2% of results.

Stanines

- The stanine (standard nine) divides a score scale into nine units.
- Stanines represent a range representing a certain number of standard deviations from the average.
- The average result lies in the middle of the 5th stanine (the mid-point).
- Stanines 2, 3, 4, 5, 6, 7, and 8 cover a range of 0.5σ each.
- Stanines 1 and 9 cover all other results.

Below average results Above average results



Key differences

- The percentile rank divides a score scale into 100 units.
- The sten (standard ten) divides a score scale into ten units.
- The stanine (standard nine) divides a score scale into nine units.

Key differences

- Stens and stanines identify a student's test result within a fairly narrow range. These bands are narrow enough to distinguish statistically significant differences but wide enough not to over-emphasise minor differences between students.
- Percentile ranks are more precise measures of the same data, which helps to differentiate more closely within a narrow range and to identify progress over time more easily.



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