

UNIT 02 / 06 · LEARN & TRY

Averages and frequency distributions

Name: _____ Date: _____

Goal: Calculate and interpret central averages, recognising limitations of a single summary.

Learn

An average summarises the central location of observations but does not describe every feature of a dataset. The arithmetic mean divides the total of values by their number. With frequencies, multiply each value by its frequency, add these products and divide by total frequency. The median is the middle ordered value, or the mean of the two middle values when the number is even. The mode is the most frequent value; a dataset may have several modes or no unique mode. For grouped data, class midpoints support an estimated mean because the exact observations are unknown. An extreme value can pull the mean substantially while leaving the middle rank less affected. Two datasets can therefore share a mean yet have different distributions. Always order data before locating a median and use frequencies as counts rather than averaging category labels. Explain what the chosen average reveals and what it leaves unresolved.

Worked example

Values 5,10,15 have frequencies 2,3,1. Total frequency is 6 and weighted total is $2 \times 5 + 3 \times 10 + 1 \times 15 = 55$. Mean = $55/6 \approx 9.17$. Ordered observations are 5,5,10,10,10,15, so median and mode are both 10.