

6.1.4 Grouped Summaries

Name: _____ Class: _____ Date: _____

KEY WORDS modal class

<!-- Session 2 native-skill companion -->

Objective

Practise grouped summaries within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Frequency summaries and grouped estimates · Foundation

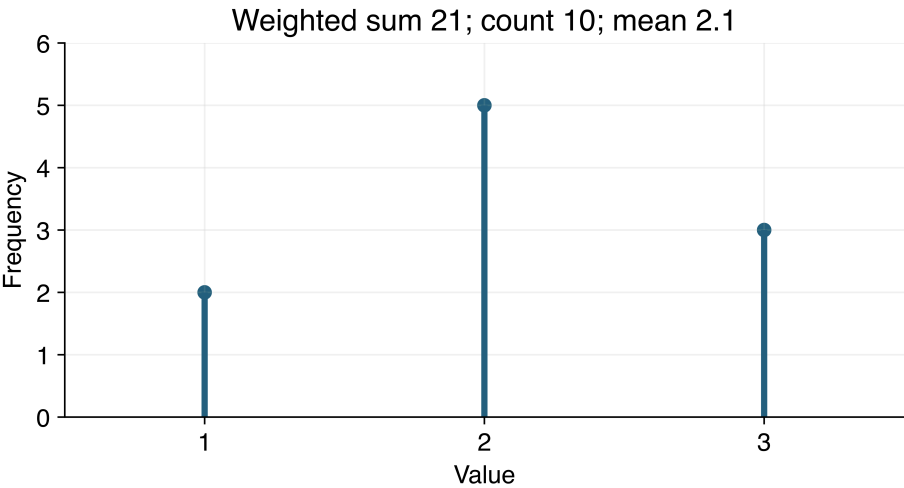
For exact value frequencies, mean is $\text{sum}(\text{value} \times \text{frequency}) / \text{total frequency}$. Locate the median using cumulative counts. For interval data, use class midpoints to estimate a mean; the exact values are unknown. The modal class has greatest frequency, which need not be the tallest unequal-width histogram bar. Compare a suitable average and spread, in context, and state the limitations of grouping or outliers.

$$\bar{x} \approx \frac{\sum fm}{\sum f}$$

Values 1,2,3 with frequencies 2,5,3 give total 10 and weighted sum $2+10+9=21$, so mean is 2.1. The fifth and sixth observations are both 2, giving median 2 and mode 2. For continuous classes $0 \leq x < 10, 10 \leq x < 20, 20 \leq x < 30$ with frequencies 2,5,3, midpoints 5,15,25 give estimated sum $10+75+75=160$ and estimated mean 16. The modal class is $10 \leq x < 20$. The range of individual observations cannot be recovered exactly from these intervals. For values 2,4,4,6,24, mean is 8 and median 4; the unusually large value raises the mean. Comparing two groups should describe both a typical value and variation, rather than selecting whichever summary favours a claim.

The grouped mean is an estimate because all members are represented by a midpoint. A median is not found by averaging the class labels. Outliers can alter the mean/range substantially.

AQA S4/S5 Foundation includes appropriate mean/median/mode/modal class and range, with grouped data and outlier awareness. Higher quartiles/box plots are taught separately.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find mean of values 1,2,3 with frequencies 2,5,3.

2.2 (Foundation) Find midpoint-estimated mean for classes 0–10,10–20,20–30 with frequencies 2,5,3.

2.3 (Foundation) Find median of 2,4,4,6,24.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: A grouped midpoint mean is always the exact mean of the original measurements.

Solutions

2.1 Weighted total 21 divided by count 10.

2.2 Weighted midpoint sum 160 divided by 10.

2.3 Sort and select the central third observation.

3.1 False. In the class $[0,10)$, the observations 1 and 2 have mean 1.5, while using midpoint 5 estimates mean 5. Midpoints replace unknown individual values.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.