

6.1.1 Data

Name: _____ Class: _____ Date: _____

KEY WORDS range

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

Objective

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

1 Key knowledge and worked examples

■ **Centre, spread and data displays · Foundation**

The mean is total divided by count. The median is the central value after sorting. The range is maximum minus minimum. Use frequency tables, bar charts and suitable comparisons.

$$\bar{x} = \frac{\sum x_i}{n}$$

For 2,4,4,6,9, total=25 and count=5, so mean=5. The central value is 4, so median=4. The range is 9-2=7. Explain both a typical value and the spread.

The tallest histogram bar need not contain the most observations. A grouped mean is an estimate. Correlation does not prove causation, and extrapolation extends beyond the observed range.

A bar chart uses separate bars for categories. Unequal-class-width histograms and formal density calculations are outside this Foundation/Core lesson.

■ **Data summaries, histograms and interpretation · Higher**

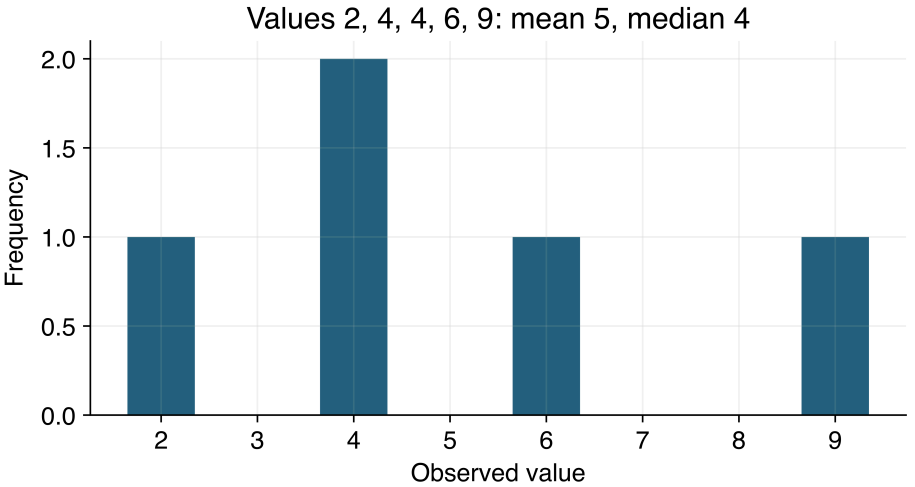
Compare an appropriate average and spread in context. A histogram uses area for frequency, so height=frequency/class width. Grouped estimates assume representative values within intervals.

$$\bar{x} = \frac{\sum x_i}{n}, \quad \text{density} = \frac{\text{frequency}}{\text{class width}}$$

A class from 10 to 20 with frequency 30 has density 30/10=3. A class from 20 to 40 with frequency 20 has density 20/20=1. Its wider bar must not be mistaken for a larger density. For values 2,4,4,6,9, the median is 4 and mean is 5.

The tallest histogram bar need not contain the most observations. A grouped mean is an estimate. Correlation does not prove causation, and extrapolation extends beyond the observed range.

Choose a display that fits the data type. Give both a numerical comparison and what it means for the population; do not infer more precision than the sample supports.



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

2 Practice

2.1 (Foundation) Find the range of 2,4,4,6,9.

2.2 (Foundation) Find the mean of 2,4,4,6,9.

2.3 (Foundation) Find the median of 2,4,4,6,9.

2.4 (Higher) Find the density for frequency 30 and class width 10.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The mean of a list must always be one of its observed values.

Solutions

2.1 Range=maximum-minimum=9-2=7.

2.2 The total is 25 across five observations: mean= $25/5=5$.

2.3 The sorted list is 2,4,4,6,9. Its third observation is 4.

2.4 Density=frequency/class width= $30/10=3$.

3.1 False. The values 1 and 2 have mean 1.5, which is not observed. A mean balances the sum; it need not be a member of the list.

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