

Reading Bar Graphs & Histograms

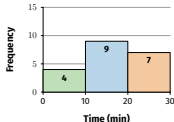


Key idea



A **bar graph** has **gaps** (separate categories); a **histogram**'s bars **touch** (continuous, equal intervals).

Example



Reading and combining



Football 8, Netball 5, Rugby 6.
Football and Rugby together = $8 + 6 = 14$.

Common mistake

Reading boundary numbers as bar labels, not the bar's height.



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The Mode and the Modal Class

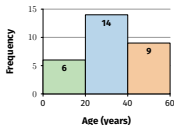


Key idea



The **mode** (bar graph) or **modal class** (histogram) is the **tallest bar** — the highest frequency.

Example



Finding the modal class



Frequencies 6, 14, 9 across three equal intervals.
Tallest bar is 20–40 (freq 14) $\Rightarrow$ modal class = 20–40.

Common mistake

Picking the largest *boundary numbers*, not the tallest bar.



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Weighted Averages



Key idea

A **weighted average** combines groups of **different sizes**: multiply each average by its size, add, then divide by the **combined size**.

Correct method

Class A: 18, 64%. Class B: 12, 74%.
$$\frac{18(64) + 12(74)}{30} = \frac{2040}{30} = 68\%.$$

Common mistake

Averaging directly: $\frac{64 + 74}{2} = 69\%$
is **wrong** — it ignores the different group sizes.

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Estimating Mean & Median from Grouped Data



Key idea

Estimate a **mean** using each class's **midpoint**, weighted by frequency.
Estimate a **median** by **interpolating** in the middle-value class.

Common mistake

Using a boundary, not the midpoint, for the mean.

Mean

0-10(4), 10-20(10), 20-30(6); midpoints 5, 15, 25.
 $4(5) + 10(15) + 6(25) = 320$; $320 \div 20 = 16$.

Median

$n = 30$, half = 15th. CF 6, 16, 25, 30:
class 20-40.
 $(15 - 6) \div 10 = 0.9$; $20 + 0.9(20) = 38$.

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Cumulative Frequency & Class Widths

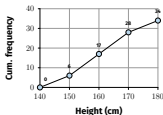


Key idea



A **cumulative frequency graph** plots running totals against the upper class boundary. Find half the total, then read across for the **median**.

Example



Equal class widths matter



A bar's height is only fair when **every class has the same width**. Otherwise use **frequency density** = $\text{freq} \div \text{width}$.

Common mistake

Comparing bar heights directly when widths differ.



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