

Statistics Class 10 — Chapter Summary

Mean, median and mode of grouped data · NCERT Chapter 13 · CBSE Statistics & Probability unit

One question, three answers: **what is a typical value?** For the **mean**, replace each class by its class mark; for the **median**, walk down the cumulative frequency; for the **mode**, start at the tallest class.

Key definitions

Term	What it means	The trap
Class mark (x_i)	(lower limit + upper limit) / 2 — stands in for every value in the class	Using a limit instead of the midpoint
Cumulative frequency (cf)	Running total of frequencies down the table	Not building the column before the median
Median class	First class whose cf is $\geq n/2$	Choosing the class with the biggest f
Modal class	The class with the highest frequency	Choosing the middle class by habit
Class size (h)	Width of each class — all equal, all continuous	Leaving 1–10, 11–20 gaps unadjusted

The core formulas

Measure	Formula
Mean — direct	$\bar{x} = \Sigma f_i x_i / \Sigma f_i$
Mean — assumed mean	$\bar{x} = a + \Sigma f_i d_i / \Sigma f_i$, where $d_i = x_i - a$
Mean — step deviation	$\bar{x} = a + h \times \Sigma f_i u_i / \Sigma f_i$, where $u_i = (x_i - a) / h$
Median	Median = $l + ((n/2 - cf) / f) \times h$, l, f of the median class; cf of the class <i>before</i> it
Mode	Mode = $l + ((f_1 - f_0) / (2f_1 - f_0 - f_2)) \times h$, f_0 before, f_2 after the modal class

Sanity check: all three methods for the mean give the same answer. The empirical relationship $3 \text{ Median} \approx \text{Mode} + 2 \text{ Mean}$ is a quick cross-check, not a method.

What NCERT and CBSE actually examine

Exercise	Topic	Questions
Exercise 13.1	Mean of grouped data — all three methods	9
Exercise 13.2	Mode of grouped data (NCERT teaches mode <i>before</i> median)	6
Exercise 13.3	Median of grouped data	7

CBSE 2026-27 content line: “Mean, median and mode of grouped data (bimodal situation to be avoided).” Statistics shares the **11-mark** Statistics & Probability unit with Probability (units: 6, 20, 6, 15, 12, 10, 11 = 80). **Ogives were removed**; the **step-deviation method was not**.

Key takeaways

- **Build the table first** — class marks, fx or cf columns are part of the answer and earn method marks.
- **Median needs cf** — find $n/2$, then the first class whose cf reaches it.
- **Mode needs neighbours** — f_0 is the class before, f_2 the class after; never swap them.
- **Pick the easiest mean method** — step deviation when class marks are large; the answer does not change.
- **One modal class only** — CBSE avoids bimodal data, so a tie means recheck your frequencies.
- **No ogives** — formula methods only; 22 NCERT questions cover the whole chapter.

One table, all three measures

A board-style question worked the way the marks are given

WORKED EXAMPLE · 5 MARKS

Find the mean, median and mode of the distribution below.

Class	f	Class mark x	fx	cf	$u = (x - 25)/10$	fu
0-10	4	5	20	4	-2	-8
10-20	7	15	105	11	-1	-7
20-30	10	25	250	21	0	0
30-40	6	35	210	27	1	6
40-50	3	45	135	30	2	6
Total	30		720			-3

Step 1 – Mean. $\bar{x} = \Sigma fx / \Sigma f = 720 / 30 = 24$. Step deviation, same table: $25 + 10 \times (-3/30) = 25 - 1 = 24 \checkmark$ **Step 2 – Median.** $n = 30$, so $n/2 = 15$. The first cf ≥ 15 is 21, so the median class is **20-30**: $l = 20$, $cf = 11$, $f = 10$, $h = 10$.
Median = $20 + ((15 - 11) / 10) \times 10 = 20 + 4 = 24$ **Step 3 – Mode.** Highest frequency 10, so the modal class is **20-30**: $l = 20$, $f_1 = 10$, $f_0 = 7$, $f_2 = 6$, $h = 10$.
Mode = $20 + ((10 - 7) / (20 - 7 - 6)) \times 10 = 20 + 30/7 = 24.29$ (to 2 d.p.)**Check:** all three answers lie inside 20-30, where the data is heaviest. Mode + 2 Mean = $24.29 + 48 = 72.29$, and 3 Median = 72 – close, as the empirical relationship expects.

WHEN THE QUESTION IS NOT A CLEAN TABLE

The stem says	What you do first
"Less than 10: 4, less than 20: 11, ..."	Subtract consecutive totals to get f: 4, 7, 10, 6, 3
Classes 1-10, 11-20, 21-30, ...	Make them continuous: 0.5-10.5, 10.5-20.5, ...
"The mean is 24", frequencies 4, 7, p, 6, 3	$\Sigma fx = 470 + 25p$, $\Sigma f = 20 + p$; solve $(470 + 25p)/(20 + p) = 24 \Rightarrow p = 10$

WHERE THE MARKS ACTUALLY GO

What the examiner looks for	How students lose it
The complete table (x, fx or fu, cf)	Writing only the final numbers – the table <i>is</i> the working
Correct median class from cf	Taking the class with the biggest frequency instead
f_0 and f_2 in the right places	Swapping them, or using the modal class's own f twice
Substitution shown before simplifying	Jumping to a decimal and slipping on the denominator $2f_1 - f_0 - f_2$

NOW TRY THIS ONE

Classes 0-10, 10-20, 20-30, 30-40, 40-50 with frequencies **7, 10, 15, 8, 10**. Find the mean, median and mode.**Answers:** mean **25.8** ($\Sigma f = 50$, $\Sigma fx = 1290$) · median **25.33** ($n/2 = 25$, cf before = 17) · mode **24.17** ($f_0 = 10$, $f_2 = 8$). The same table is worked step by step in the examfront guides to the mean, median and mode of grouped data.

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Free Chapter 1 – start practising at no cost**Mistake identification** – see whether it was the table, the class or the formula**Anytime tests** – practise mean, median and mode whenever you are ready**Weekly tests** – keep every chapter fresh, week after week**Mock tests before the exam** – full papers in the real CBSE pattern**Adaptive practice** – the right grouped-data question at the right level

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