Unit 21 · Presentation of Data

STUDY NOTES

Key terms

Frequency: how many times a value comes in the data.

Cumulative frequency: a running total: a row's frequency plus all the frequencies above it.

Cumulative frequency table: a frequency table with a cumulative frequency column.

Line graph: dots for the values, joined in order by straight lines; shows **change** over days, months, years.

Simple bar graph: one bar for each name, all one color.

Multiple bar graph: two or more related sets of numbers, a group of bars side by side for each name (two sets: a **double bar graph**).

Key (legend): says which color is which set.

Cumulative frequency table

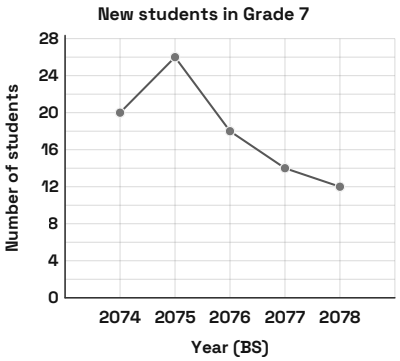
Books sold	Tally	Frequency	Cumulative frequency
10	|||	3	3
12	||	2	3 + 2 = 5
13	||||	4	5 + 4 = 9

1. go through the list once, a tally mark in the right row for each value
2. count the tallies: the frequency
3. add each frequency to the running total above it

- the **last** cumulative frequency = the number of values (30 days): a check that none was missed
- a row's cumulative frequency = how many **up to and including** that row: row 15 says 13 → on 13 days the shop sold 15 books **or fewer**
- how many of exactly one value: the plain frequency (row 18: frequency 4, cumulative 19)

Line graph

1. write the data in a table
2. two axes: what it is counted over (days, months, years) along the **X-axis**; the numbers up the **Y-axis**
3. a Y-scale that fits the biggest number (1 square for 5); number every line or every second line
4. a dot straight above each name at its number (a dot can sit between two lines: 28 just over half a square above 25); join in order
5. a title; name both axes



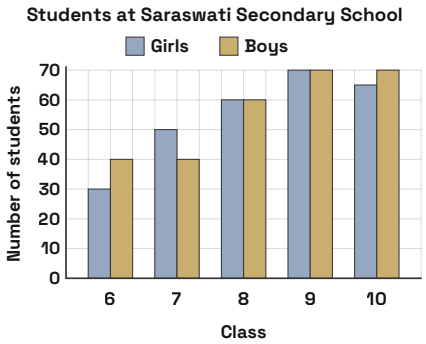
Grade 7's enrollment, 2074 to 2078, as a line graph.

- a line graph back to a table: read each dot across to the scale
- line **up**: the number rose; **down**: it fell; **flat**: no change
- the **steeper** the line, the bigger the change: rain 25 → 10 mm, a fall of 15
- the highest dot: the biggest number; the lowest: the smallest
- read a dot straight across to the scale: Monday's dot halfway between 20 and 25 → 22.5
- **only for names in order** (days, months, years, birthdays): favorite fruits or kinds of vehicle need a bar graph
- numbers with unequal gaps along the bottom (2, 4, 6, 9, 12 kg): each dot at its own distance on the scale
- price and quantity in direct proportion (Rs. 250 a kg): the dots lie on one straight line through 0
- values close together (30–37 °C): start the scale above 0 (at 28) with a **zigzag** on the axis; 1 square for 1 °C shows the changes
- two lines on one graph (with a key) compare two sets: Kathmandu and Pokhara

Multiple bar graph

- each name: a group of bars side by side, one for each set

- every bar the **same width**; its **height** is its number
- each set its own color, with a **key**
- **no gap** inside a group; a **gap** between groups
- Saraswati school, Class 8: 60 girls and 60 boys → equal; Class 9 the most, 70 + 70 = 140
- add a group's bars for its total; compare one color across the groups for one set
- "% more than" compares with the number after "than": 4 kg → 14 kg is 10 ÷ 4 × 100% = **250%** more



Girls and boys in Classes 6 to 10, with a key.

Which graph?

Question	Graph
change through time, in order	line graph
one set, things with no order	simple bar graph
two or more sets, side by side	multiple bar graph

- rain month by month, two cities: double bars compare the cities **month by month**; two lines show the **change through the year**
- choose the graph for the question you want answered

Back to Kathmandu and Pokhara

- temperature (1991–2020): two lines, the same shape: coldest in January, warmest June–August; Pokhara's line **above** Kathmandu's every month, by about 2 °C (Pokhara lower: about 830 m against 1,340 m)
- rain, May–October: double bars; Pokhara's bar 2 to 4 times Kathmandu's every month; July 941 mm against 384 mm
- a year: Pokhara about 3,900 mm, Kathmandu about 1,500 mm

COMMON MISTAKES

✗ a line graph for favorite fruits
✓ a bar graph: no order.

✗ the steepest line = the biggest number
✓ the biggest change; the biggest number is the highest dot.

✗ cumulative 19 at 18 books = sold 18 books on 19 days
✓ on 19 days, 18 or fewer.

✗ gaps inside a group, groups touching
✓ bars of a group touch; gaps between groups.

✗ no key on a double bar graph
✓ add one.

✗ 14 kg against 4 kg: 10 ÷ 14 × 100% more
✓ divide by the 4 kg after "than": 250%.