

Organising Data: Bar Graphs, Range and Mean

Unit: Data Handling - Student Practice Worksheet

Overview: Ms. Rao handed Kabir a messy list of 20 students' shoe sizes, scribbled in the order they were measured. Kabir stared at the jumble, unable to say anything useful about it at a glance. Anaya turned the same list into a bar graph, and suddenly three questions were answered in one look.

Practice Questions (30 Total)

Section A - Easy

Q1. Dots at 8 and 15 on the line. What is the range of 8, 12, 9, 15, 11?



- ☐ A. 7
- ☐ B. 6
- ☐ C. 15
- ☐ D. 11

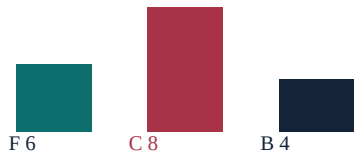
Q2. In a bar graph, what does the height of each bar represent?

- ☐ A. The alphabetical order of the category
- ☐ B. The exact time each item was recorded
- ☐ C. The frequency (count) of that category
- ☐ D. A random value with no meaning

Q3. What is the mean of the data set 8, 12, 9, 15, 11?

- ☐ A. 12
- ☐ B. 11
- ☐ C. 10
- ☐ D. 55

Q4. Sports bars: Football 6, Cricket 8, Badminton 4. Tallest bar?



- ☐ A. Football
- ☐ B. Badminton
- ☐ C. All were equal
- ☐ D. Cricket

Q5. What is a frequency table used for?

- ☐ A. Counting how many times each category or value occurs
- ☐ B. Recording exact timestamps
- ☐ C. Listing data in random order
- ☐ D. Drawing pie charts only

Q6. What is the range of the data set 5, 5, 5, 5?

- ☐ A. 5
- ☐ B. 0
- ☐ C. 10
- ☐ D. 20

Q7. Bars of height 2, 4, 6. What is the mean of 2, 4, 6?



- ☐ A. 3
- ☐ B. 6
- ☐ C. 4
- ☐ D. 12

Q8. How is data first organised before drawing a bar graph?

- ☐ A. It is drawn directly from raw, unsorted data
- ☐ B. It must be converted to percentages first
- ☐ C. It cannot be organised at all

- ☐ D. Into a frequency table using tally marks or counts

Q9. What is the range of the data set 10, 20, 30, 40?

- ☐ A. 30
☐ B. 40
☐ C. 10
☐ D. 25

Q10. Mean of 10, 20, 30, and why divide the sum by 3.

- ☐ A. 30
☐ B. 20
☐ C. 10
☐ D. 60

Section B - Medium

Q11. Scores from 12 to 20 on the line. Range of 14, 18, 12, 20, 16?



- ☐ A. 8
☐ B. 6
☐ C. 20
☐ D. 12

Q12. Why can Kabir not easily answer 'what is the most popular sport?' just by staring at the raw, unsorted list?

- ☐ A. The raw list contains no useful information at all
☐ B. Without organising it into counts, it is easy to lose track while scanning
☐ C. Raw data is always shorter than organised data
☐ D. It is actually just as easy either way

Q13. For the same scores 14, 18, 12, 20, 16, what is the mean?

- ☐ A. 18
☐ B. 16

- ☐ C. 14
- ☐ D. 80

Q14. Smallest 5, range 20. Where is the largest value?



- ☐ A. 25
- ☐ B. 15
- ☐ C. 20
- ☐ D. 10

Q15. In Anaya's sports tally, she initially counted only 18 out of 20 students. What did she do next?

- ☐ A. Ignored the missing two students
- ☐ B. Assumed the extra two were errors in the survey itself
- ☐ C. Rechecked and corrected two entries until the total matched 20
- ☐ D. Started the whole tally over from a blank sheet

Q16. A data set has a mean of 10 and 5 values. What is the sum of all 5 values?

- ☐ A. 10
- ☐ B. 15
- ☐ C. 5
- ☐ D. 50

Q17. Five equal bars of 6. What is the range?



- ☐ A. 6
- ☐ B. 30
- ☐ C. 1
- ☐ D. 0

Q18. If a new, very high score is added to a data set, what typically happens to the range?

- ☐ A. It increases, or stays the same
- ☐ B. It always decreases
- ☐ C. It always stays exactly the same
- ☐ D. Range cannot be affected by new data

Q19. A data set is 6, 6, 6, 6, 6. What is its mean?

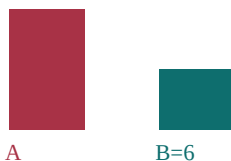
- ☐ A. 0
- ☐ B. 30
- ☐ C. 6
- ☐ D. 5

Q20. Tea 5, Coffee 8, Juice 3: tallest bar, and why height is the count.

- ☐ A. Tea
- ☐ B. Coffee
- ☐ C. Juice
- ☐ D. All bars would be equal

Section C - Challenge

Q21. A bar is twice as tall as B=6. How many A grades?



- ☐ A. 6
- ☐ B. 3
- ☐ C. 18
- ☐ D. 12

Q22. Anaya says a bar graph is more useful than a raw list specifically because it makes ONE particular kind of question fast to answer. Which kind?

- ☐ A. Comparison questions, like 'which category is most/least common'
- ☐ B. Questions about the exact order data was originally recorded in
- ☐ C. Questions requiring no numbers at all

- ☐ D. A bar graph answers every possible question equally well

Q23. A data set of 8 values has a mean of 15. If one value is removed and the new mean of the remaining 7 values is 14, what was the removed value?

- ☐ A. 22
- ☐ B. 15
- ☐ C. 14
- ☐ D. 8

Q24. Strip of 100: maroon 40, then 30, 20, 10. Fraction in the most popular?



40 of 100

- ☐ A. 40/100, or two fifths
- ☐ B. 30/100, or three tenths
- ☐ C. 10/100, or one tenth
- ☐ D. 100/100, all students

Q25. A data set has range 12 and mean 20. If every value in the set is increased by 5, what are the new range and mean?

- ☐ A. Range becomes 17, mean stays 20
- ☐ B. Range stays 12, mean becomes 25
- ☐ C. Both range and mean stay the same
- ☐ D. Both range and mean increase by 5

Q26. A data set has 4 values summing to 60. Three of the values are 12, 18, and 15. What is the 4th value, and what is the mean?

- ☐ A. 4th value is 20, mean is 15
- ☐ B. 4th value is 15, mean is 20
- ☐ C. 4th value is 15, mean is 15
- ☐ D. 4th value is 10, mean is 15

Q27. Equal dots, mean 10 and range 0. What is every value?

● ● ● ● mean 10, range 0

- ☐ A. Every value must be less than 10
- ☐ B. Every value must be exactly 10
- ☐ C. Every value must be greater than 10
- ☐ D. Nothing can be concluded

Q28. Two data sets, X and Y, have the same mean but X has a much larger range than Y. What does this tell you?

- ☐ A. X and Y must contain identical values
- ☐ B. Y's values must all be negative
- ☐ C. X's values are more spread out than Y's, even though they average to the same value
- ☐ D. This situation is mathematically impossible

Q29. A frequency table's bars total 50 students across 5 categories, each shown with a different height. If one category's bar is removed from the chart entirely, what must be true about the remaining total?

- ☐ A. It will still total exactly 50
- ☐ B. It will always become exactly 40
- ☐ C. The remaining total cannot be determined at all
- ☐ D. It will be less than 50, by exactly that category's frequency

Q30. Why teach sports bars and ages together for data handling?

- ☐ A. Because categorical data has no real use in mathematics
- ☐ B. Because bar graphs suit categories while range and mean suit numeric values — both are core data-handling tools
- ☐ C. Because numeric data cannot be shown on a bar graph at all
- ☐ D. The two examples teach identical, redundant ideas

Answer Key

- Q1:** (A) (a) 7. Range = largest (15) minus smallest (8) = 7.
- Q2:** (C) (c) The frequency (count) of that category.
- Q3:** (B) (b) 11. Sum is 55, divided by 5 values, gives a mean of 11.
- Q4:** (D) (d) Cricket. It had the highest count, 8.
- Q5:** (A) (a) Counting how many times each category or value occurs.
- Q6:** (B) (b) 0. The largest and smallest values are both 5, so $5-5=0$.
- Q7:** (C) (c) 4. Sum is 12, divided by 3 values, gives a mean of 4.
- Q8:** (D) (d) Into a frequency table using tally marks or counts.
- Q9:** (A) (a) 30. Range = largest (40) minus smallest (10) = 30.
- Q10:** (B) (b) 20. Sum is 60, divided by 3 values, gives a mean of 20.
- Q11:** (A) (a) 8. Range = 20 minus 12 = 8.
- Q12:** (B) (b) Without organising it into counts, it is easy to lose track while scanning.
- Q13:** (B) (b) 16. Sum is 80, divided by 5 values, gives a mean of 16.
- Q14:** (A) (a) 25. Largest = range plus smallest = $20 + 5 = 25$.
- Q15:** (C) (c) Rechecked and corrected two entries until the total matched 20.
- Q16:** (D) (d) 50. Mean times count gives the sum: $10 \times 5 = 50$.
- Q17:** (D) (d) 0. All values are equal, so largest minus smallest is 0.
- Q18:** (A) (a) It increases (or stays the same), since the largest value may grow.
- Q19:** (C) (c) 6. When every value is identical, the mean equals that value.
- Q20:** (B) (b) Coffee. It has the highest frequency, 8.
- Q21:** (D) (d) 12. Bar height is proportional to frequency, so twice the height means twice the count: $2 \times 6 = 12$.
- Q22:** (A) (a) Comparison questions, like 'which category is most/least common'. Bar height makes visual comparison immediate.
- Q23:** (A) (a) 22. Original sum was $8 \times 15 = 120$; new sum is $7 \times 14 = 98$; the removed value is $120 - 98 = 22$.
- Q24:** (A) (a) $40/100$, or two fifths. The tallest bar (40) represents the most popular category out of the 100 total students.
- Q25:** (B) (b) Range stays 12, mean becomes 25. Shifting every value by the same amount shifts the mean but not the spread between largest and smallest.
- Q26:** (C) (c) 4th value is 15, mean is 15. $60 \text{ minus } (12+18+15) = 15$ for the missing value, and $60/4 = 15$ for the mean.
- Q27:** (B) (b) Every value must be exactly 10. A range of 0 means the largest and smallest values are equal, so every value in the set equals the mean.

Q28: (C) (c) X's values are more spread out than Y's, even though they average to the same value. Mean and range describe different things — typical value versus spread.

Q29: (D) (d) It will be less than 50, by exactly that category's frequency. Removing a bar removes its count from the overall total.

Q30: (B) (b) Because bar graphs suit categories while range and mean suit numeric values — both are core data-handling tools.

You've got this! Keep learning and shining! - Ruchi Math Coaching