Unit 14 · Presentation of Data

HARDER PRACTICE QUESTIONS · ANSWER KEY

Full marks 32

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 The missing row

ANSWER A · 3

i. Nisha 5 + 5 + 1 = **11**. Aisha 5 + 4 = **9**. Dipesh 5 + 1 = **6**.

ii. 40 slips, 2 blank, so 38 votes. 38 − 11 − 9 − 6 = **12** for Rohan.

iii. **Rohan**, with 12, by 12 − 11 = **1 vote** over Nisha.

MARKING SCHEME

- ✓ 11, 9 and 6.
- ✓ Rohan 12 (the blank slips left out).
- ✓ Rohan wins by 1 vote.

2 Find the counting mistake

ANSWER U · 3

i. The numbers add up to 8 + 7 + 4 + 2 = **21**, but only **20** friends answered. One answer was counted twice.

ii. Counting again: football 8, **cricket 6**, volleyball 4, basketball 2. The cricket row is wrong: it should be **6**, not 7. Check: 8 + 6 + 4 + 2 = 20. ✓

MARKING SCHEME

- ✓ The total is 21, not 20.
- ✓ Cricket is the wrong row.
- ✓ Cricket 6.

3 The school next year

ANSWER A · 4

i. 25 + 35 + 20 + 30 + 20 + 15 = **145** students.

ii. 35 ÷ 5 = **7 squares**.

iii.

Grade	1	2	3	4	5	6
Students next year	30	25	35	20	30	20

iv. **Grade 3**, with 35: this year's Grade 2 moves up into it.

MARKING SCHEME

- ✓ 145 students.
- ✓ 7 squares.
- ✓ The table for next year.
- ✓ Grade 3.

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking

4 Choose the scale

ANSWER A · 4

i. The tallest bar, 200 trees, would need 200 ÷ 10 = 20 squares. The paper has only 12.

ii. **1 square for 20 trees.** Every number is a multiple of 20, so every bar ends on a line: 6, 4, 10, 7 and 3 squares, and the tallest fits in 12. With 1 square for 50, the bars would be 2.4, 1.6, 4, 2.8 and 1.2 squares: short, and hard to draw and read.

iii. The vertical axis goes 0, 20, 40, … 200 (or 240). Bar heights: Janata 6 squares, Saraswati 4, Himalaya 10, Bhanu 7, Shanti 3. All bars the same width, the same gap between them, a title such as "Trees planted by five schools", and both axes named.

MARKING SCHEME

- ✓ 20 squares are needed, more than 12.
- ✓ 1 square for 20, every bar ending on a line.
- ✓ The five bars at the right heights.
- ✓ Title, scale from 0 and both axes named.

5 What is wrong with the diagram?

ANSWER U · 4

i. On his axis 20 is on the bottom line, 25 one square up, 30 two squares, 40 three, 45 four. So the 2079 bar is **2 squares** and the 2080 bar **4 squares** tall. 45 looks **twice** as much as 30, but it is only one and a half times as much.

ii. First, the axis must **start at 0**, not 20. Second, the steps must be **equal**: he jumped from 30 to 40, leaving out 35. Third, all bars must be the **same width**: a wider bar looks bigger than its number.

MARKING SCHEME

- ✓ 2 squares and 4 squares; it looks twice as much.
- ✓ Start at 0.
- ✓ Equal steps (35 missing).
- ✓ Bars the same width.

6 Won in neither class

ANSWER HA · 4

i. 5A: **football** (12). 5B: **volleyball** (13).

ii.

Game	Both classes
Football	12 + 6 = 18
Cricket	11 + 12 = 23
Volleyball	5 + 13 = 18

iii. **Cricket**, with 23.

iv. **No.** Cricket won in neither class, but it came a close second in both. Football did badly in 5B, and volleyball badly in 5A. Added together, cricket comes out on top.

MARKING SCHEME

- ✓ Football in 5A, volleyball in 5B.
- ✓ The table for both: 18, 23, 18.
- ✓ Cricket wins.
- ✓ No: cricket was a close second in both classes.

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking

7 From a bill to bars

ANSWER A · 4

i.

Item	Money (Rs.)
Tea	60 × 25 = 1,500
Coffee	20 × 60 = 1,200
Samosa	45 × 20 = 900
Noodles	15 × 120 = 1,800
Total	**5,400**

ii. **1 square for Rs. 300** (or Rs. 100): tea 5 squares, coffee 4, samosa 3, noodles 6. (With Rs. 100: 15, 12, 9 and 18 squares.) Title, axes named, bars the same width.

iii. **No.** Tea sold the most cups (60), but each cup is cheap. **Noodles** brought in the most money, Rs. 1,800, from only 15 plates.

MARKING SCHEME

- ✓ The four amounts.
- ✓ Total Rs. 5,400.
- ✓ A bar diagram with a scale where every bar ends on a line.
- ✓ Noodles brought in the most money.

8 Work back from the bars

ANSWER A · 3

i. 30 ÷ 6 = **5 books** a square.

ii. Science 4 × 5 = **20**. Comics 9 × 5 = **45**.

iii. 12 ÷ 5 = 2, remainder 2: **2 squares and two-fifths of a square**. It ends inside a square, so it is hard to draw exactly and hard to read.

MARKING SCHEME

- ✓ 5 books a square.
- ✓ 20 science books and 45 comics.
- ✓ 2 and two-fifths squares, ending inside a square.

9 Make your own

ANSWER HA · 3

i. Try apple = 1: mango 2, so banana and orange share 20 − 3 = 17. That can't be split into two equal whole numbers. Apple = 2: mango 4, banana and orange share 20 − 6 = 14, so **7 each**. Mango (4) is not the most. ✓ Apple = 3: mango 6, 20 − 9 = 11 can't be shared equally. Apple = 4: mango 8, banana and orange 6 each, but then mango is the most. ✗ Bigger numbers make mango even bigger. So **apple 2, mango 4, banana 7, orange 7**.

ii. Any list with those numbers, for example: banana, orange, mango, banana, orange, apple, banana, orange, mango, banana, orange, banana, mango, orange, apple, banana, orange, mango, banana, orange. The table adds up to 2 + 4 + 7 + 7 = 20. ✓

MARKING SCHEME

- ✓ Apple 2, mango 4, banana 7, orange 7.
- ✓ Shows why other numbers don't work.
- ✓ A list of 20 that fits, checked with a table.

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking

See it at Science Playground

Exhibits and plants at the center, Bhaktapur, that go with this unit. Book a class visit at science-playground.com/booking.

- **Galton Board** (exhibit): After the balls fall, the piles look like a bar diagram: the taller the pile, the more balls landed in that slot.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	0	7	18	7	**32**

Science Playground, Katunje, Bhaktapur
Book a class visit: https://science-playground.com/booking