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

1 Shoe sizes

ANSWER U · 4

i.

Shoe size	3	4	5	6	7	Total
Frequency	3	6	8	5	2	**24**

The tally marks: size 4 is one bundle of five and one more; size 5 one bundle and three more; size 6 one bundle.

ii. **Size 5**, with 8 students.

iii. $8 + 5 + 2 =$ **15 students**.

iv. **Sizes 7 and 3** (2 and 3 students).

MARKING SCHEME

- ✓ The frequencies 3, 6, 8, 5, 2, adding to 24.
- ✓ Size 5.
- ✓ 15 students.
- ✓ Sizes 7 and 3.

2 Spot the errors

ANSWER U · 3

i. The numbers of books are **not in order** (0 should come before 1); the frequency of **2 books is 5**, not 4; the student who read **5 books is missing**.

ii. Her frequencies add up to **13**, but **15** students answered.

iii.

Books	0	1	2	3	4	5	Total
Frequency	2	4	5	2	1	1	**15**

MARKING SCHEME

- ✓ The three mistakes: the order, 5 for 2 books, and 5 books missing.
- ✓ Her total is 13, not 15.
- ✓ The correct table.

3 Choosing a scale

ANSWER A · 4

i. Sunday's bar would be 46 squares tall, far more than the 10 squares there is room for.

ii. **1 square = 5 customers**: the tallest bar, 46, is then 9.2 squares and fits under 10. (1 square = 10 customers also fits, but the bars are short and harder to compare.)

iii. Sunday: $46 \div 5 =$ **9.2 squares**, just over 9. Thursday: $12 \div 5 =$ **2.4 squares**, a little under two and a half.

iv. Days along the X-axis, "Customers" up the Y-axis marked 0, 5, 10, … 50; bars of the same width with equal gaps; heights 9.2, 3.6, 5, 6.2, 2.4 and 7.6 squares; a title such as "Customers in one week".

MARKING SCHEME

- ✓ 46 squares won't fit.
- ✓ A scale that fits, such as 1 square = 5.
- ✓ Sunday 9.2 and Thursday 2.4 squares (for that scale).
- ✓ A bar diagram with title, axes, scale from 0, equal bars and gaps.

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4 A diagram that misleads

ANSWER HA · 3

i. That Tuesday sold **twice as many** cups as Monday: its bar is twice as tall.

ii. **No**: 50 is only 5 more than 45, a ninth of 45. Because the scale starts at 40, the bars show only the part above 40 (5 and 10), and the difference looks much bigger.

iii. Monday: $45 \div 5 = $ **9 squares**; Tuesday: $50 \div 5 = $ **10 squares**, almost the same.

MARKING SCHEME

- ✓ It seems to say twice as many.
- ✓ No: 50 is only 5 more, because the scale starts at 40.
- ✓ 9 squares and 10 squares.

5 The missing frequency

ANSWER A · 3

i. $18 + 25 + 12 + 9 = 64$, and $80 - 64 = $ **16**.

ii. **Math**, with 25.

iii. $25 - 18 = $ **7** more.

MARKING SCHEME

- ✓ 16.
- ✓ Math.
- ✓ 7.

6 Which class walks more?

ANSWER HA · 3

i. **Yes**: 14 is more than 12.

ii. 6A: $\frac{12}{30} \times 100 = $ **40%**. 6B: $\frac{14}{40} \times 100 = $ **35%**.

iii. Walking is more common in **6A**: 40% of the class against 35%. Rehan wasn't right: 6B is a bigger class, so its count is bigger even though a smaller part of it walks.

MARKING SCHEME

- ✓ Yes, 14 is more than 12.
- ✓ 40% and 35%.
- ✓ 6A, because classes of different sizes must be compared by their share.

7 Make your own

ANSWER A · 3

For example: **"How do you usually come to school?"** Groups: on foot, bus, cycle, motorbike, other. The table has three columns, Way to school, Tally marks and Frequency, one row for each group, and a Total row.

Check: the frequencies must add up to the number of students who answered.

Any survey is right if the question has a clear answer for each student, the groups cover every answer (an "other" group helps), and the table is ready to fill in.

MARKING SCHEME

- ✓ A clear question with its groups.
- ✓ A table with columns for tally marks and frequency.
- ✓ The check: the frequencies add up to the number asked.

8 Think: from the table back to the data

ANSWER

i. $6 + 9 + 4 + 1 = $ **20 families**.

ii. $6 \times 1 + 9 \times 2 + 4 \times 3 + 1 \times 4 = 6 + 18 + 12 + 4 = $ **40 children**.

iii. $4 + 1 = $ **5 families**.

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iv. **No.** A frequency table keeps only how many times each value came, not who gave it or in what order. Those are in the raw data. HA · 4

MARKING SCHEME

- ✓ 20 families.
- ✓ 40 children, each number of children times its families.
- ✓ 5 families.
- ✓ No: the table keeps only the counts.

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): When the balls have fallen, 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	10	10	**27**

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