Year 9 Statistics – Developing

ANSWER KEY HappyKids.fit

Answers and worked solutions · 10 questions

A. Use statistics

1. **Before: median 49, range 17. After: median 42, range 24. Before took longer on average; Before has the smaller range, so the times were more consistent.**

   Before: 9 values; median = value 5 = 49; range = 57 − 40 = 17
   After: 11 values; median = value 6 = 42; range = 56 − 32 = 24
   Compare an average (the median) and the spread (the range), in context

2. **50 students; estimated mean 33.6 minutes**

   Read the frequencies: 8, 2, 12, 6, 11, 11 (total 50)
   Midpoints: 5, 15, 25, 35, 45, 55
   Estimated mean = (5 × 8 + 15 × 2 + 25 × 12 + 35 × 6 + 45 × 11 + 55 × 11) ÷ 50 = 33.6 minutes

3. **Farm A: estimated mean 1.7 kg; Farm B: estimated mean 2.74 kg. Farm B had heavier lambs on average.**

   Farm A: (0.5 × 6 + 1.5 × 7 + 2.5 × 4 + 3.5 × 3) ÷ 20 = 1.7
   Farm B: (0.5 × 1 + 1.5 × 4 + 2.5 × 8 + 3.5 × 12) ÷ 25 = 2.74
   The higher estimated mean is Farm B's

4. **Jan to Feb; percentage change +33.3% (to 1 d.p.), an increase; the overall trend is increasing**

   Changes: Jan–Feb −10, Feb–Mar +10, Mar–Apr +5, Apr–May +10, May–Jun −5
   Biggest fall: Jan to Feb
   Percentage change = (40 − 30) ÷ 30 × 100 = ≈ 33.3%

5. **Collect each student's height and arm span (both quantitative, continuous). Method: measure a random sample of students. A large, unbiased sample makes the conclusion more reliable.**

   Data: each student's height and arm span (both quantitative, continuous)
   Method: measure a random sample of students
   Check the sample is large enough and not biased

6. **Biased: people near a skateboard shop are more likely to want a skate park. Better: ask a random sample of residents from across the town. Further question: Do older and younger residents feel differently?**

   Who is missed or over-represented? People near a skateboard shop are more likely to want a skate park
   Better: ask a random sample of residents from across the town
   Further question: Do older and younger residents feel differently?

7. **modal class 0 < t ≤ 10; estimated mean 19.4 minutes**

   Midpoints: 5, 15, 25, 35
   Sum of midpoint × frequency: 5 × 11 + 15 × 2 + 25 × 2 + 35 × 10 = 485
   Estimated mean = 485 ÷ 25 = 19.4 minutes
   Modal class: the highest frequency is 11

8. 12 girls

Boys, Salad: 47 − 19 − 18 = 10

Girls, Salad: 22 − 10 = 12

9. It is misleading because the axis does not start at 0, so the difference looks much bigger than it really is.

Look at the scale, the sample, the pictures and the claim

Problem: the axis does not start at 0, so the difference looks much bigger than it really is

A fair version would correct this

10. The 8 people who like both were counted twice: 23 + 11 − 8 = 26 people.

Error: the overlap was counted twice

Only French: 23 − 8 = 15; only Spanish: 11 − 8 = 3

Total: 15 + 8 + 3 = 26