# Year 7 · Statistics: Reading the Story in Data

Name: _____ Date: _____

This sheet helps you pull the story out of data, finding the middle, measuring the spread, spotting shapes and skew, and noticing when a graph is trying to trick you. Take your time and show your working!

## Warm-up

1. Find the median of these numbers: 5, 2, 8, 3, 7.

2. Find the range of: 15, 22, 9, 31, 18.

3. Find the mean of: 4, 6, 8, 10.

4. Find the median of: 10, 4, 7, 2, 9, 6.

## Practice

5. A Year 7 class was asked "How many brothers and sisters do you have?" The results were: three students said 0, eight said 1, six said 2, three said 3, one said 4, and one said 5 (22 students in total). Find the median and range, and describe the shape of the data.

6. Mia scored these goals in her 7 netball games: 4, 6, 5, 8, 6, 7, 6. What is the median number of goals, and what is the range?

7. A bar graph at Avondale Intermediate shows favourite lunches: pies 12, sushi 18, sandwiches 15, hot chips 25, fruit 8. Which is the most popular and which is the least popular lunch, and how many students were surveyed altogether?

8. Six friends timed how long it took to walk to Vertex Academy (in minutes): 12, 13, 11, 14, 12, 45. Work out the range. Is there an outlier, and how does it affect the range?

9. A cereal advertisement shows a bar chart claiming "Brand X has WAY more fibre!" but the chart has no title, no numbers on the vertical axis, and no units. Explain why this graph cannot be interpreted accurately.

10. In a spelling test most students scored highly, but a few scored quite low: 4, 6, 7, 8, 8, 9, 9, 9, 10, 10. Describe the shape of this data (symmetrical or skewed, and which way).

## Challenge

11. Two hockey teams recorded their goals over 5 games. Kererū: 20, 22, 21, 23, 24. Tūī: 5, 40, 22, 10, 38. Find the median and range for each team, then say which team is more consistent and why.

12. Six numbers, written in order from smallest to largest, are: 3, 7, x, 12, 15, 20. The median of the six numbers is 10. Find the value of x, then work out the range.

## Answer key (for parents and tutors)

1. Find the median of these numbers: 5, 2, 8, 3, 7.
   **Put them in order: 2, 3, 5, 7, 8. There are 5 numbers, so the median is the middle (3rd) value. Median = 5.**

2. Find the range of: 15, 22, 9, 31, 18.
   **Range = largest – smallest = 31 – 9 = 22.**

3. Find the mean of: 4, 6, 8, 10.
   **Add them: 4 + 6 + 8 + 10 = 28. Divide by how many (4): 28 ÷ 4 = 7. Mean = 7.**

4. Find the median of: 10, 4, 7, 2, 9, 6.
   **Put them in order: 2, 4, 6, 7, 9, 10. There are 6 numbers (even), so the median is halfway between the 3rd and 4th values: (6 + 7) ÷ 2 = 6.5. Median = 6.5.**

5. A Year 7 class was asked "How many brothers and sisters do you have?" The results were: three students said 0, eight said 1, six said 2, three said 3, one said 4, and one said 5 (22 students in total). Find the median and range, and describe the shape of the data.
   **List in order there are 22 values. The median is halfway between the 11th and 12th values. Counting up: values 1–3 are 0, values 4–11 are 1, values 12–17 are 2. So the 11th value = 1 and the 12th value = 2. Median = (1 + 2) ÷ 2 = 1.5 siblings. Range = 5 – 0 = 5 siblings. Shape: most students have a small number of siblings, with a long thin tail stretching out to the larger values (4 and 5). The right tail tapers more slowly, so the data is positively skewed (skewed to the right).**

6. Mia scored these goals in her 7 netball games: 4, 6, 5, 8, 6, 7, 6. What is the median number of goals, and what is the range?
   **Put the scores in order: 4, 5, 6, 6, 6, 7, 8. There are 7 games, so the median is the middle (4th) value = 6 goals. Range = 8 – 4 = 4 goals. So on a typical game Mia scored about 6 goals, and her scores varied over a range of 4 goals.**

7. A bar graph at Avondale Intermediate shows favourite lunches: pies 12, sushi 18, sandwiches 15, hot chips 25, fruit 8. Which is the most popular and which is the least popular lunch, and how many students were surveyed altogether?
   **Compare the frequencies. The tallest bar is hot chips with 25, so hot chips is the most popular (most frequent). The shortest bar is fruit with 8, so fruit is the least popular (least frequent). Total surveyed = 12 + 18 + 15 + 25 + 8 = 78 students.**

8. Six friends timed how long it took to walk to Vertex Academy (in minutes): 12, 13, 11, 14, 12, 45. Work out the range. Is there an outlier, and how does it affect the range?
   **Range = 45 – 11 = 34 minutes. The value 45 is an outlier, it is far away from the other times, which are all close to 11–14 minutes. Because of this one unusual value, the range of 34 makes the walk times look far more spread out than they really are. If we set the outlier aside, the other five times (11, 12, 12, 13, 14) have a range of only 14 – 11 = 3 minutes, which better describes the group. It would be worth checking whether the 45 was a mistake or a genuine special case (e.g. someone stopped on the way).**

9. A cereal advertisement shows a bar chart claiming "Brand X has WAY more fibre!" but the chart has no title, no numbers on the vertical axis, and no units. Explain why this graph cannot be interpreted accurately.
   **Without a vertical axis scale and units we cannot tell how much fibre each bar represents, we don't know if the difference is 1 gram or 10 grams. Without a title or axis labels we don't even know for sure what is being measured or in what units. A bar that looks 'twice as tall' might only be a tiny real difference, especially if the axis doesn't start at zero. Because these key parts are missing, the graph may be misleading and hiding information, so we cannot draw a fair conclusion from it.**

10. In a spelling test most students scored highly, but a few scored quite low: 4, 6, 7, 8, 8, 9, 9, 9, 10, 10. Describe the shape of this data (symmetrical or skewed, and which way).
    **Look at where the values pile up. Most scores are bunched at the high end (8, 9, 10), with a longer thin tail stretching down to the low scores (4, 6). The left tail tapers more slowly than the right tail, so the data is negatively skewed (skewed to the left).**

11. Two hockey teams recorded their goals over 5 games. Kererū: 20, 22, 21, 23, 24. Tūī: 5, 40, 22, 10, 38. Find the median and range for each team, then say which team is more consistent and why.
**Kererū in order: 20, 21, 22, 23, 24 → median = 22 (middle value); range = 24 − 20 = 4. Tūī in order: 5, 10, 22, 38, 40 → median = 22 (middle value); range = 40 − 5 = 35. Both teams have the same median (22), so their 'typical' scores are similar. However, Kererū's range is only 4 while Tūī's range is 35, meaning Tūī's scores are much more spread out. Kererū is the more consistent team, because their scores stay close to the median from game to game, while Tūī swings between very low and very high scores.**

12. Six numbers, written in order from smallest to largest, are: 3, 7, x, 12, 15, 20. The median of the six numbers is 10. Find the value of x, then work out the range.
**With 6 numbers the median is halfway between the 3rd and 4th values, which are x and 12. So (x + 12) ÷ 2 = 10. Multiply both sides by 2: x + 12 = 20. Subtract 12: x = 8. (Check: 8 sits correctly between 7 and 12, so the list stays in order.) The full set is 3, 7, 8, 12, 15, 20. Range = 20 − 3 = 17.**