

# Helping Your Child with Statistics

Statistics · Foundation to Year 6 · Australian Curriculum Mathematics

**Statistics** is about collecting information, displaying it clearly, and making sense of it. Your child uses statistics to answer real questions — about their class, their community, or the world. The same four steps are used from Foundation to Year 6: **ask a question, collect data, display it, and interpret what it means**. Each year the data gets richer and the graphs more powerful.

| Year level                 | What your child learns                                                                                                                                                                                                                                                                                                                                                                                                                                                        | What this looks like                                                                                                                                                                                  |
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| <b>Foundation</b>          | <b>Sorting objects to answer a question</b><br>Your child collects and sorts objects to answer a simple question.<br><b>data</b> — information you collect<br><b>category</b> — a group things are sorted into<br>Example question: <b>"Do more children have lace-up shoes or velcro shoes?"</b><br>Children line up in two groups — that IS a data display!<br>They use objects and images — no numbers yet.                                                                | Sort a group of household objects:<br><b>"Which ones are round? Which are not?"</b><br>Use toys: sort into two piles.<br><b>"Which pile has more?"</b><br>Line up the family by height — that's data! |
| <b>Year 1</b>              | <b>Tally marks and pictographs</b><br>Your child records data using <b>tally marks</b> and shows it in a <b>pictograph</b> .<br><b>tally mark</b> — a mark to count things as you go (     = 5)<br><b>pictograph</b> — a graph where each picture = 1 item<br><b>frequency</b> — how many times something occurs<br><b>categorical variable</b> — data that fits into named groups, e.g. favourite colour: red, blue, green                                                   | Survey the family: favourite fruit?<br>Use tally marks to record answers.<br>Draw a pictograph — one picture per person.<br><b>"Which fruit got the most votes?"</b>                                  |
| <b>Year 2</b>              | <b>Surveys and column graphs</b><br>Your child designs a survey, collects responses and displays results in a <b>column graph</b> .<br><b>survey</b> — a set of questions used to collect information from people<br><b>column graph</b> — a graph with bars (columns) showing how many in each category<br>They compare different types of graphs of the same data and discuss which one is easier to read.                                                                  | Ask family: favourite season?<br>Draw a column graph — one column per season.<br>Make a picture graph of the same data.<br><b>"Which graph is easier to read? Why?"</b>                               |
| <b>Year 3</b>              | <b>Statistical investigations</b><br>Your child carries out a full <b>statistical investigation</b> — from question to conclusion.<br>They choose a question, collect data, make a graph, and explain what the data shows.<br><b>discrete numerical variable</b> — data you count: number of pets, number of siblings, number of books read<br><b>frequency table</b> — a table showing how many in each category                                                             | Your child might investigate:<br><b>"What is the most popular breakfast cereal in our family?"</b><br>Help them collect, tally and graph the data.<br><b>"What does the data tell us?"</b>            |
| <b>Year 4</b>              | <b>Many-to-one graphs</b><br>Your child learns that one symbol can represent more than one piece of data — this is called <b>many-to-one</b> correspondence.<br><b>Example: ★ = 5 people</b><br><b>So ★★★ means 15 people, not 3.</b><br>They must always read the <b>key</b> before interpreting the graph.<br><b>key</b> — the box that explains what each symbol means<br>They analyse which type of display best shows the data.                                          | Find a pictograph in a newspaper or book.<br><b>"What does one symbol equal?"</b><br><b>"How many people does ★★★ represent?"</b><br>Always check the key first!                                      |
| <b>Year 5</b>              | <b>Mode, line graphs and fair surveys</b><br>Your child learns two important ideas:<br><b>mode</b> — the value that appears most often in a data set<br><b>Data: 3, 5, 5, 7, 5, 2, 8 → mode = 5</b><br>They also read <b>line graphs</b> — graphs that show how something changes over time.<br>The horizontal axis shows <b>time</b> . The vertical axis shows <b>amount</b> .<br>They learn to write fair <b>survey questions</b> — questions that are clear, without bias. | Look at a weather graph or temperature chart.<br><b>"When was it hottest? Coldest?"</b><br><b>"What was the trend — was it going up or down?"</b><br>Find the mode in a list of numbers together.     |
| <i>Year 6 on next page</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                       |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                   |
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| <b>Year 6</b> | <b>Range, comparing data sets and spotting misleading graphs</b><br>Your child learns two more key measures:<br><b>mode</b> — most common value (introduced in Year 5)<br><b>range</b> — the spread of data: highest minus lowest<br><b>Data: 2, 5, 7, 9, 11 → range = 11 – 2 = 9</b><br>They compare two or more data sets side by side.<br>They also learn to spot <b>misleading graphs</b> — graphs that look dramatic<br>but use tricks like broken axes to exaggerate differences. | Find a graph in a newspaper or online.<br><b>"Does the axis start at zero?</b><br><b>Could this be misleading?"</b><br><b>"What is the range of this data set?"</b><br><b>"What is the mode?"</b> |
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★ **The 4 steps of a statistical investigation — used at every year level**

| <b>1<br/>Question</b>                                                                                                                      | <b>2<br/>Collect</b>                                                                                                                             | <b>3<br/>Display</b>                                                                                                                              | <b>4<br/>Interpret</b>                                                                                                                                                        |
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| What do you want to find out?<br>Ask a clear, specific question.<br><br>Example:<br>"What is the favourite fruit of people in our family?" | Gather the data.<br>Use a survey, tally marks, observation or experiment.<br><br>Example:<br>Ask each person. Use tally marks to record answers. | Show the data in a graph or table so it is easy to read.<br><br>Example:<br>Draw a column graph — one column per fruit, height = number of votes. | Read the graph. What does it tell you?<br>Draw a conclusion that answers your question.<br><br>Example:<br>"Mango was most popular — 4 votes. Banana had the least — 1 vote." |

*These 4 steps are the same whether your child is sorting toys in Foundation or analysing weather data in Year 6.*

# Helping at Home — Statistics

Worked examples and questions to ask · Foundation to Year 6

## How it works — worked examples

### Year 1 — Tally marks and a pictograph

Question: "What is our family's favourite colour?"

| Colour | Tally     | Total |
|--------|-----------|-------|
| Blue   |           | 4     |
| Red    |           | 2     |
| Green  | (3 marks) | 3     |

Pictograph: Blue = ★★★★★ Red = ★★ Green = ★★★

Each ★ = 1 person. **Mode (most common) = Blue**

### Year 4 — Reading a many-to-one graph

Favourite sports in Year 4 (Key: ★ = 5 students)

| Sport      | Graph (★ = 5) | Total |
|------------|---------------|-------|
| Football   | ★★★★★         | 20    |
| Swimming   | ★★★★          | 15    |
| Basketball | ★★            | 10    |

Always read the key first! ★★★ does NOT mean 3 — it means  $3 \times 5 = 15$ .

### Year 6 — Mode, range and misleading graphs

Weekly pocket money for 7 children (\$):

|     |     |     |     |     |      |     |
|-----|-----|-----|-----|-----|------|-----|
| \$2 | \$5 | \$5 | \$8 | \$5 | \$10 | \$3 |
|-----|-----|-----|-----|-----|------|-----|

|                         |                                                          |
|-------------------------|----------------------------------------------------------|
| <b>Mode</b>             | \$5 (appears 3 times — most common)                      |
| <b>Range</b>            | $\$10 - \$2 = \$8$ (spread of the data)                  |
| <b>What it tells us</b> | <b>Most children get \$5. The data spreads over \$8.</b> |

**Misleading graph tip:** Always check if the vertical axis starts at 0. If it starts higher, small differences can look much bigger than they really are.

## Questions to ask your child

You do not need to know the answer. Ask and let your child do the explaining!

### F Foundation

- Can you sort these objects into two groups?
- Which group has more? How do you know?
- How could we show this so someone else can understand it?

### 1 Year 1

- Use tally marks to record everyone's favourite colour.
- Draw a pictograph — one picture per person.
- Which category has the most? How many more than the least?

### 2 Year 2

- Write 3 questions we could ask to collect data.
- Draw a column graph from our survey results.
- Which graph is easier to read — the pictograph or the column graph?

### 3 Year 3

- What question do you want to investigate?
- How will you collect the data — survey or observation?
- Make a frequency table. What does the data tell us?

### 4 Year 4

- What does one symbol equal in this graph?
- How many people does ★★★★★ represent if ★ = 10?
- Which graph type would best show this data? Why?

### 5 Year 5

- What is the mode in this list of numbers?
- Look at this line graph — when did the temperature rise fastest?
- Is this survey question fair? Could it be improved?

### 6 Year 6

- What is the range of this data set?
- Compare these two graphs — which group has more spread?
- Does this graph start at zero? Could it be misleading?



## Things to try at home

|                                                                                                                                                       |                                                                                                                                                |
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| <b>Any age:</b> Ask a question together: "What is our family's favourite meal?" Collect answers, draw a simple graph. Talk about what the data shows. | <b>Year 1–2:</b> Make tally marks while watching TV — tally each type of ad (food, car, toy). Which type appeared most?                        |
| <b>Year 2–3:</b> Survey your street or extended family. Make a column graph of the results. What surprises you?                                       | <b>Year 4:</b> Find a pictograph in a magazine or newspaper. Read the key. How many does each symbol represent? What conclusions can you draw? |
| <b>Year 5:</b> Track the weather for two weeks. Record the daily temperature. Draw a line graph. When was it hottest? What was the trend?             | <b>Year 6:</b> Find a graph in the news. Does the axis start at zero? Is the graph trying to make something look bigger than it is?            |



## Key words to learn together

|                                                                                            |                                                                                                 |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>data:</b> information you collect — it can be words, numbers or images                  | <b>category:</b> a group that data is sorted into, e.g. red, blue, green                        |
| <b>tally mark:</b> a mark used to count as you go                                          | <b>frequency:</b> how many times something occurs in the data                                   |
| <b>pictograph:</b> a graph where each picture or symbol represents one (or more) items     | <b>column graph:</b> a graph with rectangular bars — the taller the bar, the more data          |
| <b>key:</b> the box that explains what each symbol in a graph represents                   | <b>one-to-one:</b> each symbol in a graph equals exactly one piece of data                      |
| <b>many-to-one:</b> each symbol equals more than one piece of data — always check the key! | <b>mode:</b> the value that appears most often in a data set                                    |
| <b>range:</b> the spread of data: highest value minus lowest value                         | <b>misleading graph:</b> a graph designed to make data look different from what it really shows |