# Telling the Story of Data

Findings become a story when they have one main message, one chart that proves it, and honest limits. How to turn analysis into a story anyone can act on.

## Introduction

You can do perfect analysis and still fail, if nobody understands what you found. A table of averages does not change a decision. A story does. **Telling the story of data** means taking your findings and shaping them so a busy reader gets the point in thirty seconds, believes it, and knows what to do next.

A good data story has only three parts, and that is a relief: **one main message**, **one chart that proves it**, and **honest limits** — what the data does not prove. Everything else is extra. If you cannot state your main message in one sentence, you do not have a story yet; you have a pile of results. Go back to the findings, pick the one that matters most, and build around it.

One more thing decides whether a story lands: **who is listening.** The same findings need different words for a teacher, a parent, and a student. A teacher wants the next teaching step. A parent wants to know whether their child is behind. A student wants to know what to practise. The numbers stay the same; the message, the order and the words change. Before you write a story, write down one line: "My reader is ___ and they need to decide ___." If you cannot fill those blanks, you are not ready to write yet — and Example 4 shows what the difference looks like.

*(Roman Urdu: Acha tajziya bhi bekaar hai agar koi usay samajh na sake. Kahani ke teen hisse hain — ek asal paigham, ek chart jo usay sabit kare, aur imandari se yeh batana ke data kya sabit nahi karta.)*

## Key points

- **One main message, not five.** A story with five messages is a report, and reports get skimmed and forgotten. Pick the finding that changes a decision.
- **Lead with the message, then the proof.** "English is the weak subject" first, then the numbers and the chart — not the other way round.
- **One chart that proves it.** Choose the chart from lesson DS.5 that matches your message: bars for a comparison, a line for a change over time.
- **Use plain words, not analysis words.** Say "average", not "mean of the distribution"; say "7 students", not "a sample of n=7".
- **Honest limits build trust.** "This is only 7 students" or "this covers one term only" does not weaken your story — it stops a reader from trusting it too far, which is worse.
- **Say what the data does NOT prove.** A pattern is not a cause. "Students who missed classes scored lower" does not prove that missing classes caused the low marks.

- **End with a next step.** A story without a suggested action leaves the reader impressed and stuck. One clear suggestion beats three vague ones.
- **The order that works:** message, proof (chart + two numbers), limit, next step. Four short parts, in that order, every time.
- **Round numbers for speaking, keep exact numbers for tables.** Saying "about 80" in a spoken story is clearer than "79.9"; the exact 79.9 still belongs in the written table beside it.
- **The 30-second test.** If a busy reader cannot repeat your main message after 30 seconds, the story is too long or the message is buried. Cut until it passes.

## Examples

### Example 1 — A weak story and a strong story, same findings

Findings from lesson DS.7: class average 79.9, Maths 86.0, English 67.5, one student below 70.

Weak story:

```
We analysed the data using pandas groupby operations.
The DataFrame had 7 rows after dropna. Maths mean was
86.0, English mean was 67.5, overall mean 79.9. The
standard analysis shows a difference between subjects.
```

What is wrong: it leads with tools, not the message; it uses code words; and it ends with no action. A teacher reading this learns nothing to do on Monday morning.

Strong story:

```
English needs the extra hour, not Maths. Maths averages
86, English only 67.5 — a gap of nearly 19 marks. The
chart below shows it at a glance. This is only 7 students
from one term, so treat it as an early signal, not proof —
but the first step is clear: give English one extra
practice session a week, then check again next term.
```

What is right: one message in the first sentence, one chart promised as proof, an honest limit, and one concrete next step. Same data, completely different effect.

### Example 2 — The one chart that proves the message

Message: "Maths is much stronger than English."

This example needs `pip install matplotlib` first:

```
import matplotlib.pyplot as plt

subjects = ["Maths", "English"]
averages = [86.0, 67.5]

plt.bar(subjects, averages)
plt.ylabel("Average marks")
plt.title("Maths averages 86, English only 67.5")
plt.show()
```

What this means: two bars, one message, no clutter. The title itself states the finding, so even a reader who skims sees the point. If your chart needs a paragraph to explain it, it is the wrong chart — simplify until the title can carry the message alone.

### Example 3 — Writing honest limits

```
What this data does NOT prove:
- It does not prove English teaching is bad. The test
  may have been harder, or the class may have had less
  practice time that term.
- It does not prove every class has the same gap. This
  is one class, one term, 7 students.
- It does not prove extra practice will close the gap.
  That is a suggestion to test, not a fact already shown.
```

What this means: limits are not apologies — they are the lines that keep a true story true. A reader who sees honest limits trusts the main message more, not less, because they can see exactly how far it reaches.

### Example 4 — The same findings, told to two different readers

Findings from lesson DS.7: class average 79.9, Maths 86.0, English 67.5, one student below 70.

For a teacher:

```
English needs the extra hour, not Maths. Maths averages 86,
English only 67.5, and two of the three English students sit
below 80. Give English one extra practice session a week,
then re-check after the next test.
```

For a parent:

```
The class is doing well in Maths (average 86) but needs
support in English (average 67.5). If your child is in this
class, twenty minutes of English reading at home each day
is the single most useful help right now.
```

What this means: the numbers never changed, but the message, the detail and the action all changed with the reader. The teacher gets a timetable decision; the parent gets a home habit. A story written for "everyone" usually serves no one — pick your reader first, as the Introduction says.

### Example 5 — A chart title that does the work

Weak title, from a first draft:

```
Average marks by subject
```

The reader must study the chart to learn anything. Strong title, saying the finding:

```
Maths averages 86, English only 67.5 — English needs the extra hour
```

What this means: the strong title carries the message by itself, so even a reader who only skims the page learns the point. Test every chart title this way: cover the chart and read only the title. If the title alone teaches nothing, rewrite it until it states the finding. The same test works for your first sentence — it should carry the message without the rest of the story.

### Example 6 — Real-world case: a city's traffic story

A city's traffic office studies one year's accident records and finds a clear pattern: one crossing has three times the accidents of any other, mostly in the evening. The office does not send the council a spreadsheet. It sends one message ("This crossing needs a signal first"), one chart (accidents per crossing, that crossing's bar standing out), one honest limit ("one year of data, and roadworks that year may have pushed drivers here"), and one next step ("install the signal, then compare next year's count"). The council approves the signal. The analysis was ordinary counting — the story is what turned it into a decision, and into safer evenings for real people.

*(Roman Urdu: Traffic office ki kahani bhi teen hisson ki thi — paigham, chart, limit — aur faisla usi se hua.)*

## Quick recap

- A data story has three parts: one main message, one proving chart, honest limits.
- Lead with the message, then the proof — never tools first.
- Plain words only; the reader should not need to know your code.
- Say what the data does NOT prove, in plain lines.
- End with one concrete next step.

## Common mistakes

1. **Leading with method instead of message** — "Using pandas, we..." bores the reader before the point arrives. Fix: first sentence is always the finding, in plain words.
2. **Showing five charts to prove one point** — extra charts dilute the message and confuse the reader. Fix: pick the single chart that proves the main message, and leave the rest out.

3. **Claiming a cause from a pattern** — "low attendance caused low marks" overpromises what the data shows. Fix: report the pattern, name the other possible reasons, and suggest a test before claiming a cause.
4. **Burying the message at the end** — a story that opens with background and reaches its point in the last paragraph loses readers who stopped at paragraph two. Fix: put the main message in the first sentence, then prove it.
5. **Quoting a percentage without the base numbers** — "sales rose 50%" sounds huge until you learn it rose from 2 to 3. Fix: always give the base beside the percentage: "from 2 to 3 sales a day, a 50% rise on a tiny base".

## Practice

1. Take the five-line findings from lesson DS.7 and rewrite them as one short story: message first, then proof, then limit, then next step.
2. Pick one chart type from lesson DS.5 for your story's proof chart, and write its title as a full sentence that states the finding.
3. Write three "does NOT prove" lines for your story, like Example 3. Be honest — what could also explain your pattern?
4. Read your story aloud to a friend or family member. If they cannot repeat the main message back to you, simplify it and try again.

1. Take your story from Practice 1 and rewrite it for a different reader — a student in the class instead of a teacher. What changes: the message, the words, or the suggested action?
2. Write two titles for the same chart: one weak title that only names the topic, and one strong title that states the finding. Test the strong one with the cover-the-chart test from Example 5.
3. Find one percentage in a news story or an advertisement. Can you find the base numbers behind it? Write one line saying whether the percentage is as impressive as it sounds.

## Practice quiz

**1. What does a data story need first?**

- Many charts
- One clear main message
- A long introduction
- Raw data

**Answer:** One clear main message

**2. What is a chart's job in a data story?**

- Decoration
- To show the evidence behind the message
- To replace the message

- To impress readers

**Answer:** To show the evidence behind the message

**3. What are the honest limits of a data story?**

- They make it weaker
- Saying plainly what the data does NOT prove, so nobody over-claims
- They are optional decoration
- Limits mean the data is bad

**Answer:** Saying plainly what the data does NOT prove, so nobody over-claims

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**Watch the video lesson:** https://youtu.be/bHNAU8h_ijI

**Read online:** https://scopetreasure.com/notes/ds-storytelling-data · More free tools and notes at https://scopetreasure.com