METHOD SHEET · MATHEMATICS

The Singapore method

From concrete to abstract: understanding before calculating

THE ESSENTIALS

The Singapore method is an approach to teaching mathematics developed by Singapore's Ministry of Education in the early 1980s. Its principle: every concept moves through three successive states — concrete (you handle objects), pictorial (you draw, typically using bars) and abstract (you write the operation) — covering few topics at a time, but in depth. Singapore has since ranked at the very top of international mathematics assessments (TIMSS, PISA).

- Three compulsory steps: handle, draw, then write the calculation.
- The bar model makes the structure of a problem visible before any equation.
- Fewer topics, deeper mastery: you only move on once it is solid.
- The student says their reasoning out loud — that is where the errors surface.

The principles

Concrete → pictorial → abstract
Rooted in Jerome Bruner's work on modes of representation, the sequence forbids starting with the formula. You begin with objects that can be handled, move to a drawing, and the symbol comes last — once the meaning is there.

Bar modelling
Every quantity becomes a proportional rectangle. Fractions, ratios, problems with several unknowns: the relationship between the data becomes visible, and the equation can be read straight off the drawing.

Verbalisation
The student explains what they are doing while doing it. This turns a silent exercise into a diagnosis: you hear exactly where the reasoning breaks.

Systematic variation
The same concept is presented in several guises (contexts, wordings, orders of magnitude) so the student recognises the structure rather than a familiar question type.

Fewer topics, far more depth
The Singapore curriculum deliberately covers fewer chapters than European ones, aiming for full mastery before moving on.

Example — A concrete example: the bar model

Problem: "Paul has three times as many marbles as Léa. Together they have 48. How many does Léa have?" Many 12-year-olds freeze — or write an equation at random.

1. Draw one bar for Léa (one part), then three identical bars for Paul.
2. You can now see that there are four equal parts in total.
3. Only then do you write: 48 ÷ 4 = 12. Léa has 12 marbles, Paul has 36.
4. Redraw the same diagram with different numbers, then with a letter for the unknown: the student has built algebra instead of memorising it.

How it is used in lessons

On middle-school word problems

Ratios, fractions, percentages, two-unknown problems: bar modelling beats jumping straight to an equation, which fails whenever the student has not grasped the structure of the problem.

To unlock the move into algebra
Students who "can't see" what an x is for gain enormously from drawing first. Moving to a letter then becomes a simple shorthand for the diagram.

For catch-up at high-school level
On an old gap (fractions, proportions, orders of magnitude), going back to the concrete is faster than re-explaining a rule that never made sense.

With students who need to see
Dyslexic, ADHD or strongly visual learners: the pictorial stage reduces working-memory load and makes the reasoning tangible.

Who is it for?

- From ages 9 to 15, above all on word problems and the entry into algebra.
- At high-school level, for targeted catch-up on a foundation never properly built.
- For students who "can do the calculations" but fail as soon as there is a word problem.

Its limits, honestly

- It was designed for primary school: at high-school level it repairs foundations, it does not handle derivatives or probability.
- It does not replace drill: understanding is not the same as automaticity.
- The bar model becomes unreadable on very complex problems — you must know when to drop it.
- Applied dogmatically (handling objects for its own sake), it wastes the time of students who already have number sense.

Frequently asked questions

What is the Singapore maths method?
It is an approach to teaching mathematics developed by Singapore's Ministry of Education in the early 1980s. Every concept moves through three stages — concrete (handling objects), pictorial (diagram, bar model) and abstract (writing the calculation) — covering few topics at a time and requiring full mastery before moving on.

Does the Singapore method work for a student in the French system?
Yes, mainly from primary school to age 15, and above all on problem solving and the entry into algebra. At high-school level it is used to rebuild a shaky foundation. It combines easily with the French curriculum, which remains the reference for the work done.

What is the bar model?
Each quantity in the problem is drawn as a rectangle proportional to its value. By comparing the bars, the student reads the relationship between the data directly and deduces which operation to use. It is the most transferable tool of the method: it makes the structure of a problem visible before any equation.

What are the limits of the Singapore method?
It was designed for primary school, it does not replace drill, and the bar model breaks down on very complex problems. Used systematically with a student who already has number sense, it wastes time: it is a diagnostic and unblocking tool, not a doctrine.