

PARENT WORKBOOK

Your Complete Guide to Modern Elementary Math

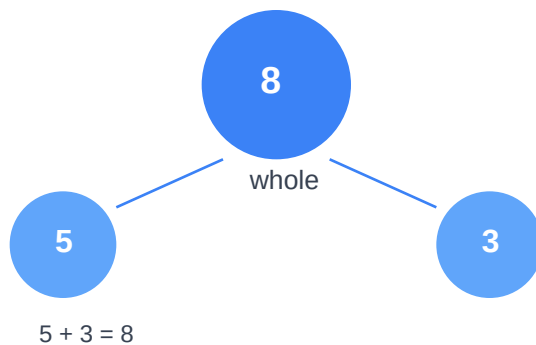
Number Bonds · Tape Diagrams · CPA · Area Models · Fractions

Section 1: Number Bonds

Number bonds show how a whole number can be broken into parts — and how those parts recombine to make the whole. This is the single most important visual tool in Singapore Math.

The Number Bond Structure

A number bond is a simple visual: a circle (whole) connected to two or more smaller circles (parts). Think of it as a family: the whole number and its two children, the parts.



Number Bonds by Grade Level

Grade K Number bonds to 5. Master bonds for 1–5 before moving on.

Grade 1 Number bonds to 10. Build fluency with +1, +2, making 10.

Grade 2

Grade 3 Apply bonds to multiplication facts. $7 = 5 + 2$ becomes 7×3 .

Grade 4

Grade 5 Apply to fraction equivalence: if $1 = 2/2 = 3/3 = 4/4...$

Parent Script: How to Help at Home

"Show me everything that makes 8." Give your child a pile of counters or blocks. Ask them to show you different ways to make 8 — and draw each way as a number bond on paper. No right or wrong answers, just exploration.

Section 2: Tape Diagrams & Bar Models

Tape diagrams (also called bar models) turn word problems into visual relationships. They are the single most powerful tool for translating "real world" math language into something your child can actually see and reason about.

The Three Core Structures

Part-Part-Whole

Use when you know both parts and want the whole, or know the whole and one part and want the other.

Example: "Sara has 5 apples. She has 3 more than Tom. How many does Tom have?"

Comparison (Add/Sub)

Use when comparing two quantities. One bar is longer or shorter than the other. Example: "James has 12 marbles. He has 4 more than Lucy. How many does Lucy have?"

Multiplication (Groups)

Use when you have equal groups. The bar shows repeated equal units. Example: "Each bag has 6 cookies. There are 4 bags. How many cookies altogether?"

Step-by-Step: Solving a Word Problem with Tape Diagrams

Example: "Emma has 15 stickers. She has 7 more than Lily. How many does Lily have?"

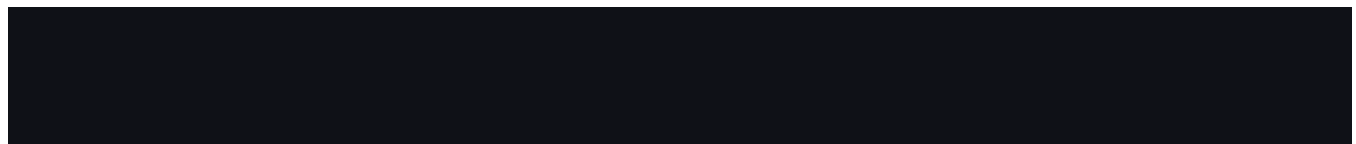
Step 1 — Identify: Emma has MORE than Lily. Draw two bars.

Step 2 — Label the known bar "Emma" with value 15.

Step 3 — Draw Lily bar shorter. Mark the difference (7) with dotted line.

Step 4 — Lily bar = 15 minus 7 = 8. Answer: Lily has 8 stickers.

Parent Script: Building Confidence



Section 3: CPA Approach

CPA = Concrete !' Pictorial !' Abstract. This is the teaching sequence Singapore Math uses — and understanding it helps you support your child at every stage, even if you never learned it yourself.

Concrete

% % %

Your child physically handles objects. Blocks, counters, toys. They build the math with their hands. At this stage, "doing" IS the understanding. Do not rush past it.

Pictorial

%i %j %j

Your child draws what they were doing with the objects. Bars, circles, dots. The drawing represents the physical action. This is where tape diagrams come from.

Abstract

1 2 3

Your child uses numbers and symbols. 23×14 , $345 + 678$. They no longer need the blocks. This is the stage most adults are comfortable with — but it comes LAST, not first.

When Your Child Is Stuck, Go Back a Stage

Trouble with area models? Go back to blocks. Trouble with fractions on a number line? Use fraction tiles. The goal is not to "skip" the intermediate stages — they are the learning.

Section 4: Area Model Multiplication

Area models break a multiplication problem into a grid of smaller, easier pieces. Instead of doing 23×14 in one step, we break both numbers apart and multiply the pieces — then add them up. Here is why it works and how to explain it.

23 × 14: Step by Step

Step 1 — Break apart each number:

$23 = 20 + 3$ | $14 = 10 + 4$

		10	4	! Row labels
20	[200]	[80]		= 280
3	[60]	[12]		= 72
Total = 352				

Why the Area Model Makes Sense

- 1. It shows WHY multiplication works — not just HOW to do it.
- 2. Each small rectangle is a simple fact: 20×10 , 20×4 , 3×10 , 3×4 .
- 3. Adding the partial products ($280 + 72$) gives the final answer: 352.
- 4. It builds the foundation for algebra: $x^2 = (a+b)(a+b)$ uses the same structure.

Parent Script



Section 5: Fraction Strips & Number Lines

Fractions confuse kids for one reason: they think "bigger denominator = bigger number." A fraction strip or number line makes that mistake impossible. Once kids see fractions as lengths on a line, they get it.

The Big Reveal: 3/8 > 1/4

Fraction Strip Comparison:

1 whole: [|||||]

1/2: [|||||]

1/4: [|||||]

Fraction Strips: Grade-Level Progression

Grade K–1	Understand half as two equal parts of a whole.
Grade 2	Understand thirds and fourths. Compare 1/2 vs 1/3.
Grade 3	Name fractions, place on number line, compare with same denominator.
Grade 4	Add/subtract fractions, equivalent fractions (3/4 = 6/8), compare unlike denominators.
Grade 5	Multiply fractions, understand decimal equivalents, connect to ratio and proportion.

Parent Script



Section 6: Old Math vs. New Math

Understanding both approaches lets you help your child AND explain why school changed. Here is how the same concept looks in the method you grew up with vs. what your child is learning now.

Addition

OLD WAY

Stack the numbers.
Add column by column.
Carry the 1.

NEW WAY

Break apart ($23 + 45 = 20+3 + 40+5$)
Add in parts ($20+40=60$, $3+5=8$)
Total: 68

Multiplication

OLD WAY

Multiply 23×4 .
Write 12, carry 1.
 $4 \times 2 = 8 + \text{carry} = 92$.

NEW WAY

Break 23 into $20 + 3$.
 $20 \times 4 = 80$, $3 \times 4 = 12$.
 $80 + 12 = 92$.

Fractions (add)

OLD WAY

$2/3 + 1/4$: Find common denominator 12.
 $2/3 = 8/12$, $1/4 = 3/12$.
 $8/12 + 3/12 = 11/12$.

NEW WAY

Use a number line.
Show both fractions.
See where they land.

Word Problems

OLD WAY

Underline numbers. Choose operation (+ or -).
Compute.

NEW WAY

Draw a tape diagram.
Show the relationships visually.
Then compute.

Section 7: Homework Helper Scripts

Scripts are readymade phrases you can say when your child is stuck. These are tested language patterns that help kids work through confusion without making them feel judged.

Tape Diagrams

When your child says "I don't know where to start"

"Let us read the problem one more time, together. Can you tell me — what is this story about? What happened first? Who has more, or less, or the same?"

Area Models

When your child says "This is too hard"

"Let us try a smaller version. Instead of 23×14 , what is 2×3 ? Can we do the same thing but with bigger numbers?"

All Subjects

When your child is fighting you

"I am not going to tell you the answer. I want to see what you know. Can you show me one thing you are sure about on this page?"

All Subjects

When your child rushes and makes mistakes

"Slow down — we have time. Take one problem at a time. Can you read the first sentence out loud? Now what does that tell us?"

Fractions

When your child gives up on fractions

"Let me show you how to draw this one. I am going to draw a fraction strip — you draw it with me. Ok, now: which is bigger, $\frac{1}{2}$ or $\frac{3}{8}$? Let us look at the picture."

All Subjects

When you don't understand the homework either

"Let us figure this out together. I may not know this method, but I know how to think through a problem. Let us start with what we DO know."

Section 8: IEP/504 Math Accommodation Checklist

If your child has an IEP or 504 plan, these are specific math accommodations to request or reinforce. Check with your school team — these are common, research-backed accommodations available in most public and many private schools.

- %j Extended time on all math tests and quizzes (1.5× or 2× standard time)
- %j Reduced number of problems per page — more white space, less visual overwhelm
- %j Scratch paper and manipulatives permitted on all assessments
- %j Answer key provided for homework (cognitive accessibility, not lowered standards)
- %j Graphic organizers and tape diagram templates provided as scaffolds
- %j Small group or one-on-one instruction for new concept introduction
- %j Fidget tools and movement breaks built into math instruction blocks
- %j Parent communication log for homework (email or app-based)

Source: IDEA 2004, Section 504 Rehabilitation Act. Accommodations must be individualized based on IEP/504 team decision. This checklist is a starting point for conversation — not legal advice.

Section 9: Answer Key for Parents

Quick reference for the most common workbook problems. Use this to verify your child's work — and to understand the steps if the answer key from school is missing or confusing.

Number Bonds: Solutions

Bonds to 5: 0+5, 1+4, 2+3, 3+2, 4+1, 5+0

Bonds to 10: 0+10, 1+9, 2+8, 3+7, 4+6, 5+5, 6+4, 7+3, 8+2, 9+1, 10+0

Bonds to 20: 10+10, 9+11, 8+12, 7+13, 6+14, 5+15, 4+16, 3+17, 2+18, 1+19

Multiplication: Area Model Solutions

$23 \times 14 = 352$ $20 \times 10 = 200$, $20 \times 4 = 80$, $3 \times 10 = 30$, $3 \times 4 = 12$!' $200 + 80 + 30 + 12 = 352$

$17 \times 8 = 136$ $10 \times 8 = 80$, $7 \times 8 = 56$!' $80 + 56 = 136$

$45 \times 6 = 270$ $40 \times 6 = 240$, $5 \times 6 = 30$!' $240 + 30 = 270$

Fractions: Comparison Answers

$3/8 > 1/4$? Yes. $3/8 = 0.375$, $1/4 = 0.25$. On a number line: $3/8$ is to the right of $1/4$.

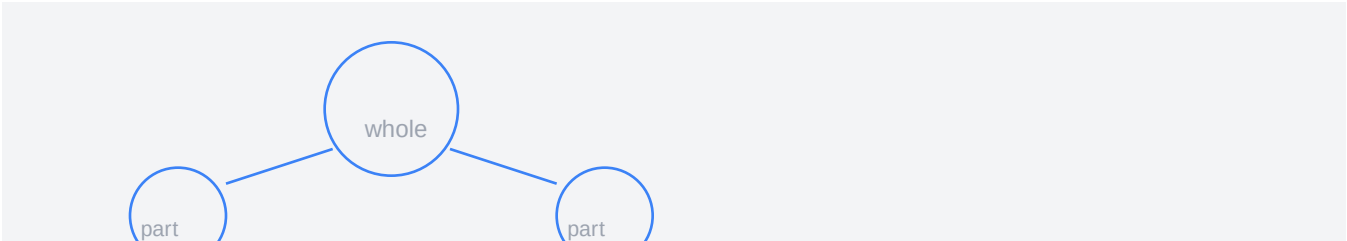
$2/3$ vs $5/6$? $5/6$ is larger. $2/3 = 4/6$, $4/6 < 5/6$.

$1/2$ vs $3/5$? $3/5$ is larger. $1/2 = 5/10$, $3/5 = 6/10$.

Appendix: Printable Templates

Photocopy or print these blank templates for use at home. Each one has space for your child to work directly on the page.

Blank Number Bond Template



Blank Tape Diagram Template

Label: _____

Long bar (larger quantity)

Short bar (smaller quantity)

Blank Fraction Strip Template

1 whole — equal parts:

1

2

3

4

5

6

7

8

Blank Area Model Grid

Break apart each factor into tens + ones, fill in the grid.			

