

MATH · Y3-Y4

# Bar Models — Introduction

How to draw and use bar models for word problems

## What is a bar model?

A bar model is a drawing that shows what's happening in a maths problem. It uses rectangles (bars) to represent quantities. The size of the bar matches the size of the number. Bar models help you SEE the problem before you calculate. They are especially useful for word problems where you have to work out which operation to use. Most mastery-style maths approaches use bar models because they make the underlying structure of a problem visible — addition, subtraction, multiplication, division, comparison, ratio — all have their own bar-model shapes.

## Bar model 1 — Whole and parts

If a problem has a TOTAL and you know the PARTS, draw a long bar for the total and split it into the parts. Example: There are 24 children in the class. 14 are girls. How many are boys? Draw a long bar of 24. Split into a part of 14 and an unknown part. The unknown is  $24 - 14 = 10$ .

## Bar model 2 — Comparison

If two amounts are being compared, draw two bars side by side. The longer bar is the bigger amount. Example: Sam has 18 stickers. Maya has 6 fewer than Sam. How many does Maya have? Draw a bar of 18 for Sam. Underneath, draw a shorter bar with a 6 missing from the end. Maya has  $18 - 6 = 12$ .

## Bar model 3 — Equal groups

If a problem has equal groups, draw equal-sized bars. Example: 4 children share 24 sweets equally. How many each? Draw 4 equal bars adding up to 24. Each bar is  $24 \div 4 = 6$ .

## Set 1: Whole and parts (draw the bar model)



1. There are 32 children in the class. 18 are wearing jumpers. How many are NOT wearing jumpers?
2. Tom has 45p. He spends 28p on a chocolate bar. How much does he have left?
3. A car park holds 60 cars. There are currently 47 cars. How many empty spaces?
4. A book has 84 pages. Sam has read 36. How many to go?
5. There are 50 sweets in a bag. 22 are red. How many are not red?
6. A library has 120 books. 45 are picture books. How many are not picture books?
7. A class has 30 children. 12 are absent today. How many are at school?
8. A train carriage holds 80 passengers. 53 are sitting. How many seats are empty?

### Set 2: Comparison (draw the bar model)

1. Sam has 24 marbles. Tom has 8 fewer. How many does Tom have?
2. A blue bag has 30 sweets. A red bag has 12 more. How many in the red bag?
3. Maya read 45 pages. Sara read 17 fewer pages. How many did Sara read?
4. A shop sold 80 lollies on Monday. On Tuesday it sold 25 fewer. How many on Tuesday?
5. An adult is 168cm tall. A child is 60cm shorter. How tall is the child?
6. The football team scored 35 goals last season. This season they scored 19 more. How many this season?
7. A pencil costs 40p. A pen costs 25p more. How much for the pen?
8. A swimming pool is 50m long. A second pool is 18m shorter. How long is the second pool?

### Set 3: Equal groups (draw the bar model)

1. 5 children share 35 stickers equally. How many each?
2. 6 packs of pencils, 8 in each pack. How many pencils in total?
3. £48 shared between 4 friends equally. How much each?
4. A teacher orders 7 packs of paper. Each pack has 100 sheets. How many sheets in total?
5. 72 cookies divided into bags of 8. How many bags?



6. 6. 9 books on each shelf. There are 6 shelves. How many books in total?

7. 7. £60 split equally between 5 children. How much each?

8. 8. 84 children split into teams of 6. How many teams?

## Answer key

Set 1: 1. 14 2. 17p 3. 13 4. 48 5. 28 6. 75 7. 18 8. 27

Set 2: 1. 16 2. 42 3. 28 4. 55 5. 108cm 6. 54 7. 65p 8. 32m

Set 3: 1. 7 2. 48 3. £12 4. 700 5. 9 bags 6. 54 7. £12 8. 14 teams

