

Bar Modelling

Bar modelling is an essential maths mastery strategy. A Singapore-style of maths model, bar modelling allows pupils to draw and visualize mathematical concepts to solve problems.

Bar modelling and the CPA approach

The bar model method draws on the the Concrete, Pictorial, Abstract (CPA) approach — an essential maths mastery concept. The process begins with pupils exploring problems via concrete objects. Pupils then progress to drawing pictorial diagrams, and then to abstract algorithms and notations (such as the +, -, x and / symbols)

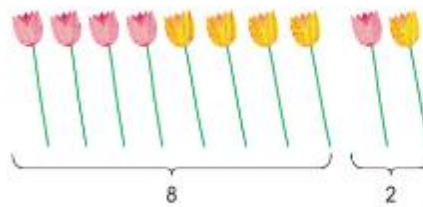
The example below explains how bar modelling moves from concrete maths models to pictorial representations.

Concrete - modelling with real objects



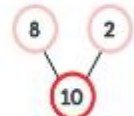
Should we add or subtract to find the total number of flowers?

There are 8 flowers in the vase.
There are 2 flowers in Hannah's hand.
How many flowers are there in total?



$$8 + 2 = 10$$

There are 10 flowers in total.



Why do we add?



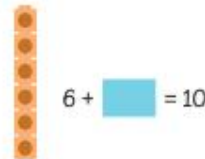
Concrete - handling real objects



How many more cubes do they need to make a stack of 10 cubes?



How many more to make 10?



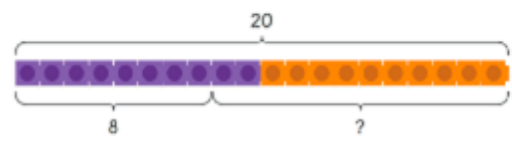
- 6 + 1 = []
- 6 + 2 = []
- 6 + 3 = []
- 6 + [] = 10



Concrete - modelling with other objects and pictures



Let's use to help us.

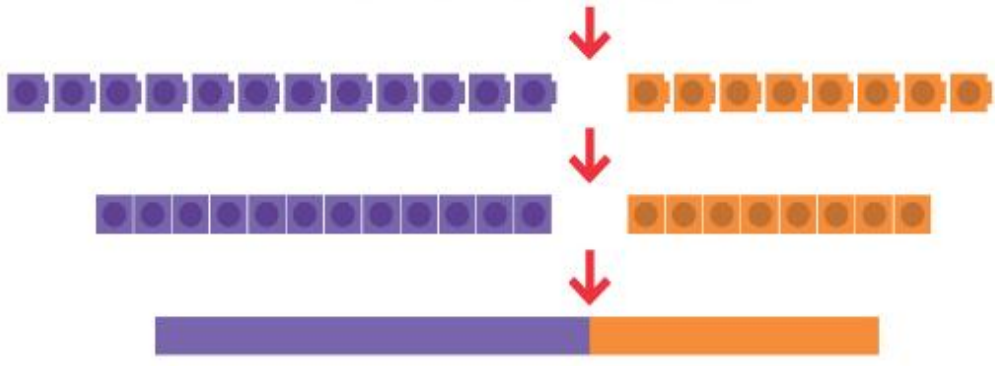
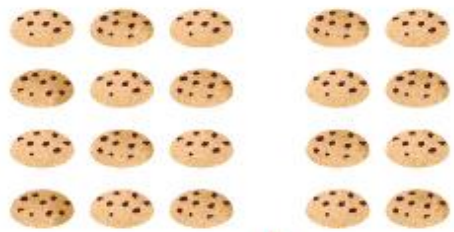


Sam bakes 20 cookies.
What if he gives some away?

What if Sam gives away 8 cookies?
 $20 - 8 =$
Then, Sam would have cookies left.



Concrete to pictorial - drawing



As shown, the bar method is primarily pictorial. Pupils will naturally develop from handling **concrete** objects, to drawing **pictorial** representations, to creating **abstract** rectangles to illustrate a problem. With time and practice, pupils will no longer need to draw individual boxes/units. Instead, they will label one long rectangle/bar with a number. At this stage, the bars will be somewhat proportional. So, in the example above, the purple bar representing 12 cookies is longer than the orange bar representing 8 cookies.