Problem Sum Solving In Primary Maths

By Kenji Wakabayashi, Managing Director, Sakamoto Educational Systems Pte Ltd

When children are in lower primary, many of them like Mathematics. As problem sums are made of short sentences, they can understand the question and find the answer easily. When they are promoted to upper primary, however, some students may experience difficulty in problem sum solving, especially in primary 5 and 6. This often occurs because the students do not understand the concept of rate. For instance, the number of times, fractions, ratio, percentage, speed are all factors that depend on rate. Thus they are unable to solve word problems that easily, even though they may have done well in lower primary.

Model drawing is a good way to help them. But sometimes they struggle to draw a model to explain how they get the answer. So is it difficult to draw a model? Let's illustrate this through an example, a typical question for primary 4 to 6 levels.

Q: Andrew had 6 times as much money as Ben at first. When their mother gave them $300 each, Andrew has 3 times as much money as Ben now. How much money did they have at first?
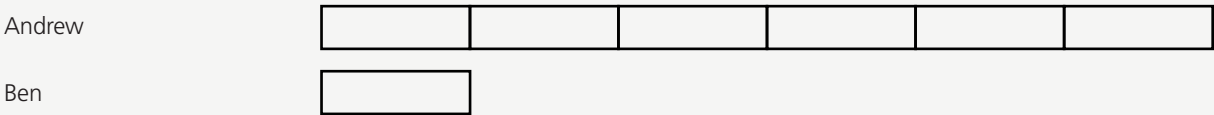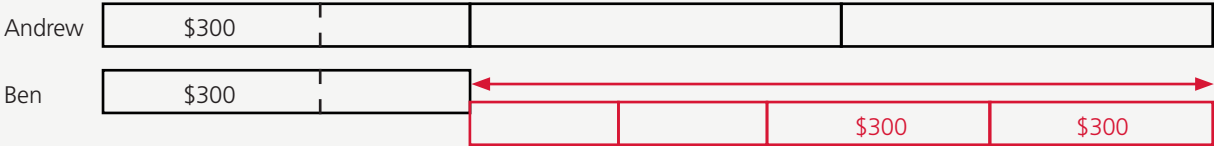
Figure 1: Before

Andrew

Ben

Figure 2: After

Andrew $300

Ben $300 $300 $300

The part shown with red arrow is made of 2 big units, each comprising of $300 and one small unit. The same highlighted part is also made up of 5 small units, as shown in Figure 1: Before.

5 units – 2 units = 3 units → $600
Hence,   1 unit → $200 → Ben's original amount of money
6 × $200 = $1200   → Andrew's original amount of money

Answer: Andrew had $1200 and Ben had $200 at first.

It's a beautiful model based on a clear logic.

But we have to be careful on one point. If we know that one small unit is equal to $200 beforehand, we will be able to draw a $300 unit, which is 1.5 times larger than a $200 unit. Some students may draw another model as shown below.
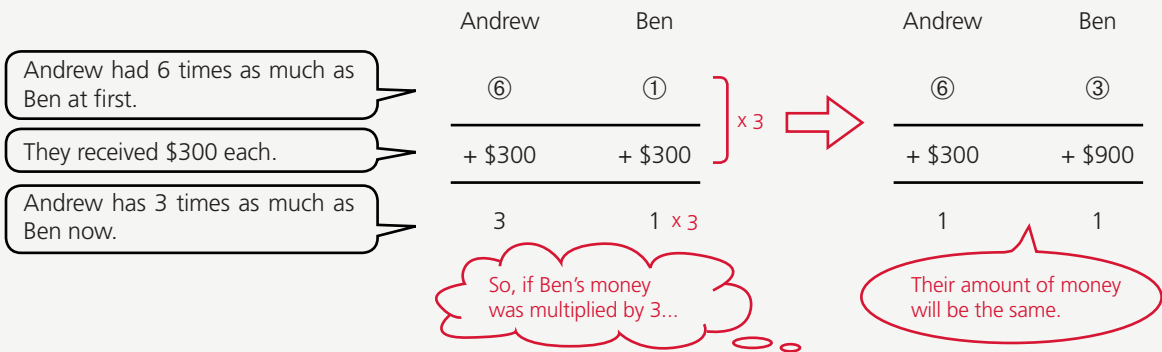
Before

Andrew

Ben

After $300

Andrew

Ben
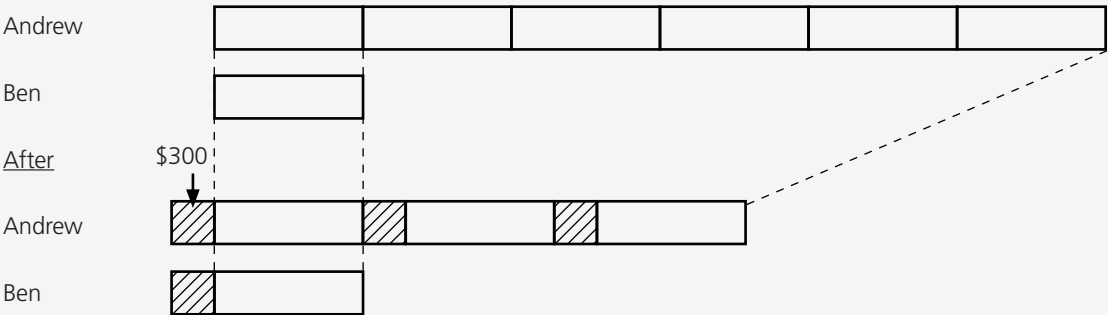
It may look wrong, but it's logically correct since $600 equals to 3 small units.

The above solution is called "Before & After Method." Depending on the question, students are required to use the "After & Before method", which is a way of reverse thinking. They must decide which method can work by reading the sentences of the question at a glance.

Is there any other easy approach?

Present the basic facts of the question in a table form and draw the line diagram. Do not worry about the relative size of each unit.

Q: Andrew had 6 times as much money as Ben at first. When their mother gave them $300 each, Andrew has 3 times as much money as Ben now. How much money did they have at first?

Let 1 unit (symbolises with ①) be the amount of money Ben had at first.

	Andrew	Ben		Andrew	Ben
Andrew had 6 times as much as Ben at first.	⑥	①	x 3	⑥	③
They received $300 each.	+ $300	+ $300		+ $300	+ $900
Andrew has 3 times as much as Ben now.	3	1 x 3		1	1

So, if Ben's money was multiplied by 3...

Their amount of money will be the same.

When you draw 2 lines of the same length, a line for Andrew which is made up of 6 units plus $300, and another line for Ben which is made up of 3 units plus $900, everybody can see clearly that $600 equals to 3 units! So, 1 unit = $200, which is what Ben had at first. We derive the same answer without knowing the relative size of each unit.

Andrew ⑥ $300

Ben ③ $900

$600 ③
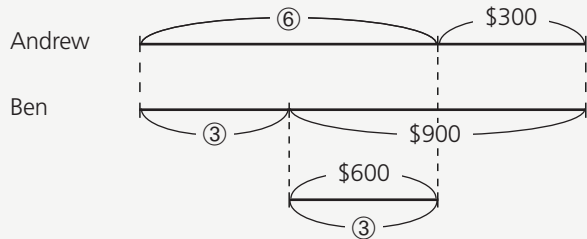
This powerful and easy approach from Japan is applicable for almost all types of word problems, and has been taught at some schools and authorised tuition centres in Singapore for 15 years. In fact, many students use it during the PSLE.

SAKAMOTO METHOD
サカモト式 ®

This article is contributed by Mr Kenji Wakabayashi, the Managing Director of Sakamoto Educational Systems Pte Ltd.