## Description

This invention can be used by primary school kids who are learning Mathematics to solve the questions using the model method and by teachers, parents and tutors to teach their students, children and tutees respectively. The model method gained popularity in Singapore because it empowers pupils to solve mathematics problems that were traditionally set only at higher levels (Fong, 1994, 1999a, 1999b; Ng & Lim, 2001). However, many of the primary school kids complain that it is tedious, troublesome and a waste of time to draw models with the current tools that they possess (eg. ruler, model drawing stencils, etc.). Thus, majority of the teachers, parents and tutors are not able to convince the kids to use the model method.

This invention is to make the life of every primary school kid easier. They can ink their chosen, scaled-to-size fractional portions stamp block on the stamp pad and produce the model drawings on the blank space provided. They do not have to waste time shifting rulers or using the stencils to draw a rectangle or having to spend time drawing an almost accurate diagram for them to deduce an understanding. As mentioned by Yan (2002), "the model must be sensibly drawn to a certain degree of proportionality so that any relationship between the units and any known part(s) may be deduced." They can use the extra time, because of using the scaled stamp blocks, to think and tackle the mathematical questions.

With reference to drawing number 1, this invention consists of stamp blocks and a stamp pad. Each stamp blocks has their lengths indicated on the bottom right. There are 13 stamp blocks (numbers are assigned in accordance to the drawing and superscripts) in total and in order from top of the picture to the bottom – [1]1 12cm block; [2]2 6cm, [3]3 4cm, [4]4 3cm, [5]6 2cm blocks attached together; [6]1 10cm block; [7]1 2cm block; [8]1 9cm block; [9]1 3cm block; [10]1 8cm block; [11]1 4cm block; [12]1 7cm block and [13]1 5cm block. The stamp blocks are arranged facing upwards in the packaging while the only stamp pad is packed at the right-hand side standing vertically with a length of 13cm.

Further understanding of the stamp blocks can be achieved by looking at drawing number 1 with labels A, B, C and D. The stamp blocks consist of protruding rectangular grooves with only its perimeter (i.e. the rectangle has a hollow center). The length of the rectangle is based on the lengths indicated on the bottom right of the stamp block. As shown in A and C, the lighter shade is a block where the user can hold to ink onto the stamp pad and the darker shade is the rectangular grooves. Treating the inner shaded portion indicated in B and D as non-existent, an inner view of the rectangular grooves can be seen. The rectangular grooves to be observed are indicated in the outer shaded portion and the hollow center is indicated as labelled in B and D.

Drawing number 2 is an overview of how the 13 stamp blocks and only stamp pad is kept in the packaging when the cover is opened. Drawing number 3 is the invention packaging's outlook.

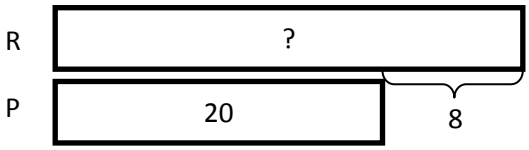
Examples of how primary school kids can utilise this invention are as follow-

1. Primary 1

*Mary has 20 pens. She has 8 more rulers than pens. How many rulers does she have?*

The child can use the [12]7cm block and [13]5cm block and create a mathematical model like this:

Since Mary has more rulers than pens, she can use the [12]7cm block to represent rulers and [13]5cm block to represent pencils and the extra portion of the block for ruler will be the 8 more rulers that she has.



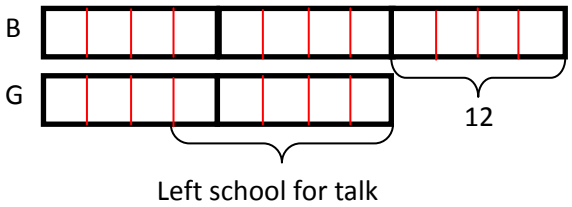

Therefore to find the number of rulers Mary has,

20+8 will be equivalent to the longer block's representative number which is 28.

2. Primary 4

*The number of girls in a school was ⅖ of the number of pupils in the class. There were 12 more boys than girls. After some girls went for a talk outside of school, the number of boys in the class was 4 times the number of the remaining girls. How many girls went for the talk outside of school?*

We have to draw a before model which states that the girls is 2 units and the boys is 3 units (total 5 unit minus girls' 2 units will be boys' 3 units). Thus we use the [3]3 4cm block for the boys to create 3 equal units and stamp 2 times of the [11]1 4cm block for the girls to create 2 equal units. Since the number of boys did not change and has to be 4 times of girls, the number of units the boys now has to be 12 units (3 x 4 to be a equal for comparison). So we have to subdivide the boys into 12 units which are represented by the red line. To be 1 unit of the 4 times, girls must be left with 3 units (12 ÷ 4 = 3).




So based on the diagram,

4 units – 12 pupils

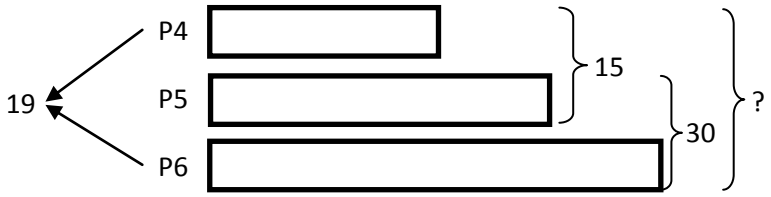
1 unit – 12 ÷ 4 = 3 pupils

5 units – 3 x 5 = 15 pupils

3. Primary 6

*In a school science fair, there were exhibits from Primary 4 to 6. Altogether 30 exhibits came from Primary 5 and 6. If 15 exhibits were not from Primary 6 and 18 exhibits were not from Primary 5, how many exhibits were there altogether?*

Since we do not know how many Primary 4, 5 and 6 are there at the school science fair, we can guess and use a rough guide to draw the models. Primary 4 is represented by the $^{10}$8cm block, Primary 5 represented by the $^{8}$9cm block and Primary 6 represented by the $^{6}$10cm block. As the question has given, there are 30 exhibits that came from Primary 5 and 6 thus represented by grouping them together. Also, it mentioned 15 exhibits were not from Primary 6, means that 15 exhibits came from Primary 4 and 5 thus grouping them together too. Lastly, since 18 exhibits were not from primary 5, means that 19 exhibits came from Primary 4 and 6. Everything can be represented in the following model:




So according to the model,

P4+P5 =15

P4 +P6 =19

P5+P6 =30

2(P4+P5+P6) = 15+19+30

2(P4+P5+P6) = 64

P4+P5+P6 = 64 ÷ 2

P4+P5+P6 = 32

**References**

Fong, H. K. (1999a). Some generic principles for solving mathematical problems in the classroom. *Teaching and Learning, 19*(2), 80-83.

Fong, H. K. (1999b). *Top marks*. Singapore: Addison Wesley Longman.

Fong, H. K. (1994). Bridging the gap between secondary and primary mathematics. *Teaching and Learning, 14*(2), 73-84.

Ng, C. H., & Lim, K. H. (2001). *A handbook for mathematics teachers in primary schools*. Singapore: Federal Publications.

Yan, K. C. (2002). The model method in Singapore. *The Mathematics Educator*, 6(2), 47-64.

## Claims

1. The usage and purpose of the stamp blocks and pad for mathematical model drawing
2. The design of the stamp blocks and pad
3. The dimensions of the stamp blocks and pad