



BAR MODEL METHOD for PSLE MATH

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In the write-up “[Euclidean Algorithm – A Bar Modelling Approach](#)”, we illustrate the Euclid’s Line Modelling Approach to solving two word problems.

In Singapore, school teachers use rectangular bars instead of line segments for the Modelling Approach. The Modelling Approach, providing a visual aid for understanding and solving the problem, is now known as the [Bar Model Method](#).

[Bar Model Method](#) involves a sequence of steps in two stages :

1. Constructing a **Holistic Bar Model** for visible **Algebraic Relations**.
2. Applying **Simple Arithmetic Computations** and **Simple Algebra** for **Unknowns**.

In the following, we will focus on the [Holistic Ratio Approach](#) as a problem solving strategy for a wide range of problems involving [Ratios](#) and [Fractions](#).

We will illustrate the holistic bar modelling approach to the variants of some recent PSLE questions and leave the PSLE questions for pupils to practise.

Example 1

Lucy had an equal number of apples and oranges.

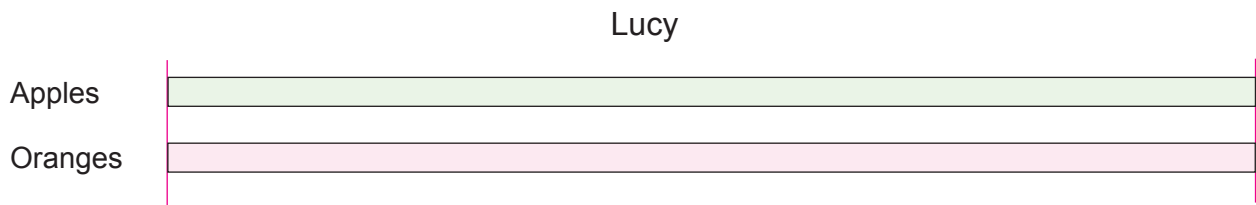
She gave 20 apples and 16 oranges to Maggie.

She gave the remaining apples and oranges to Nick. Nick was given 2 apples for every 3 oranges.

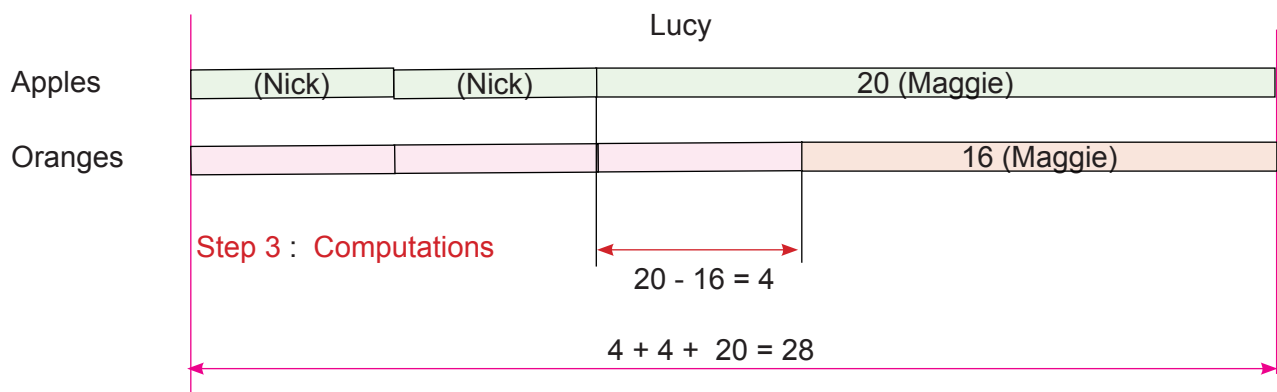
How many apples and oranges did Lucy have at first?

Solution

Step 1 : Construct a comparison bar model for Lucy to depict equal number of of apples and oranges.

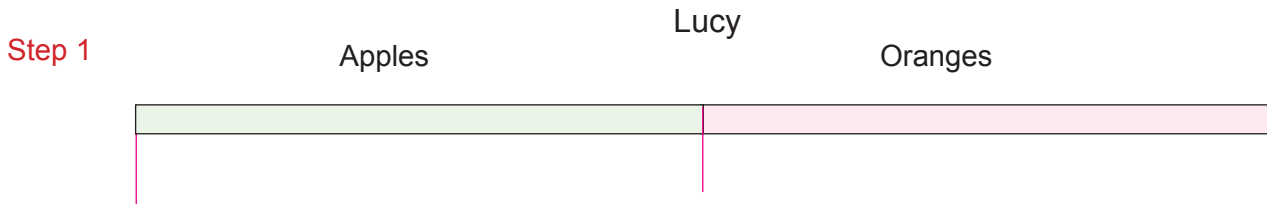


Step 2 : First, we add Nick’s situation with the ratio 2 : 3. Then add the remaining apples and oranges to Maggie as shown.

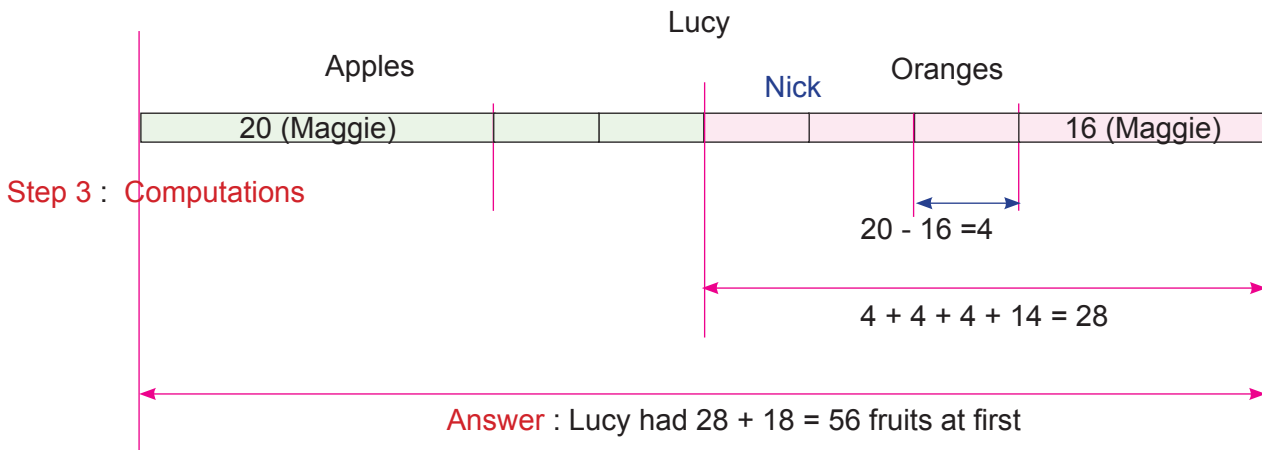


Answer : Lucy had 28 apples and 28 oranges at first.

Alternatively, you may begin with a part-whole bar model for Lucy's situation at first.



Step 2 : Next, add the Nick's situation with the ratio 2 : 3. Then add the apples and oranges to Maggie as shown.

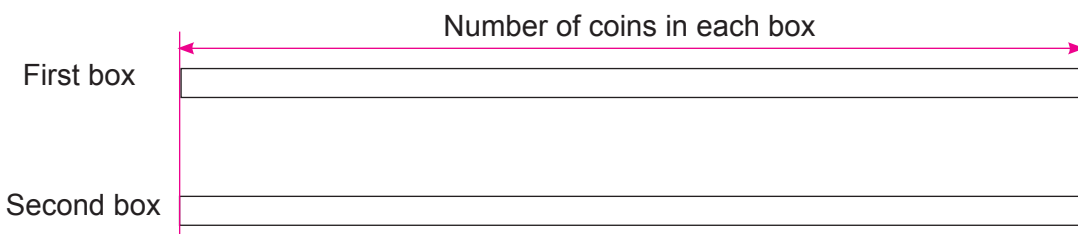


Exercise PSLE 7/02/2020

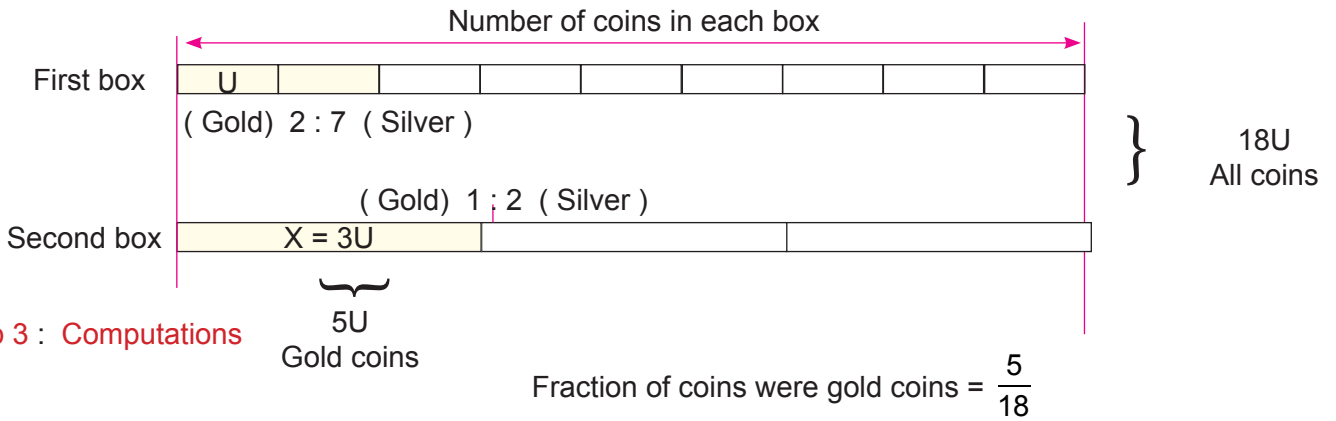
Example 2

Shawn kept his gold and silver coins in two boxes. The ratio of the number of gold to silver coins in the first box was 2 : 7 and was 1 : 3 in the second box. The two boxes contained the same number of coins. What fraction of Shawn's coin were gold coins?

Step 1 : Construct two bar models for equal number of coins.



Step 2 : Add in the situations with ratios 2 : 7 and 1 : 2. Obtain the algebraic relation $X = 3U$.



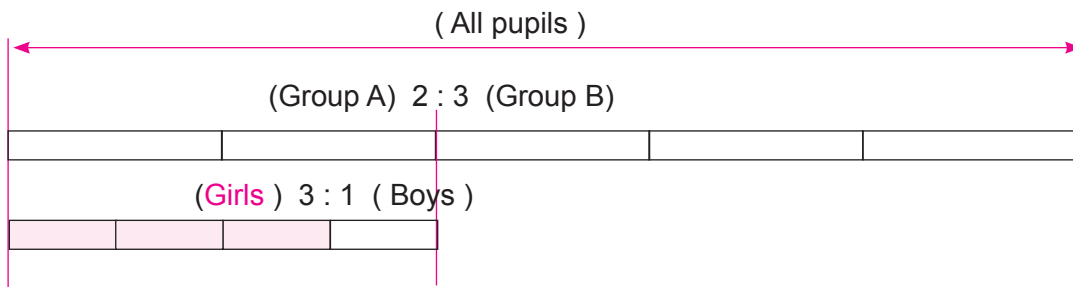
Exercise PSLE 13/01A/2019

Example 3

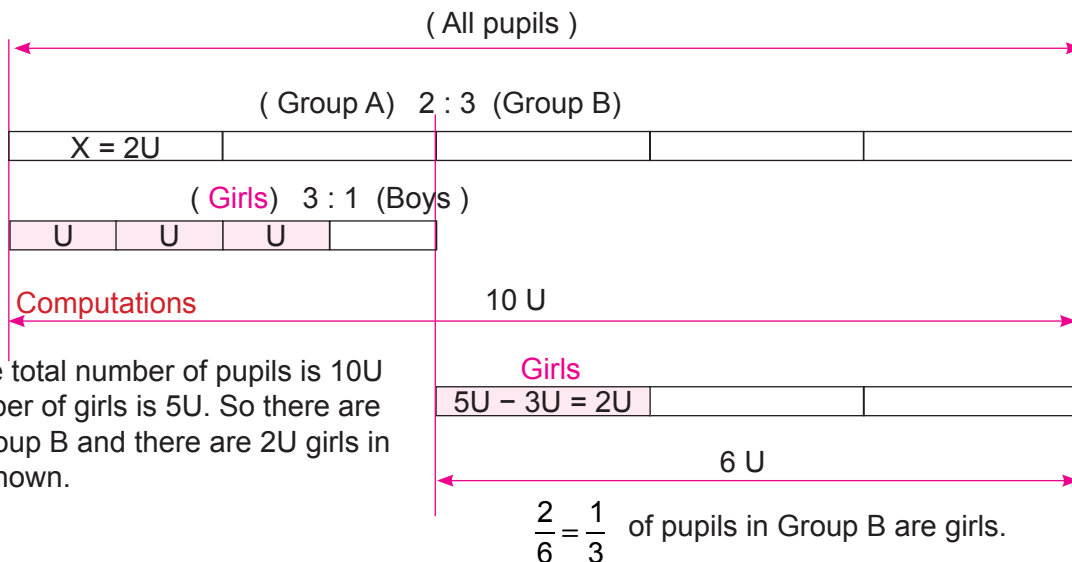
Pupils in a class are put into groups for an outdoor activity. $\frac{2}{5}$ of the pupils are in Group A and the rest in Group B. $\frac{3}{4}$ of the pupils in group A are girls. In the class, $\frac{4}{1}$ of the pupils are girls. What is the fraction of the pupils in Group B are girls?

Solution

Step 1 : Construct a bar model with ratio situations .



Step 2 : Obtain the Algebraic relation $X = 2U$.



Step 3 : The total number of pupils is 10U and the number of girls is 5U. So there are 6U girls in group B and there are 2U girls in group B as shown.

Exercise - PSLE (15/01A/19)

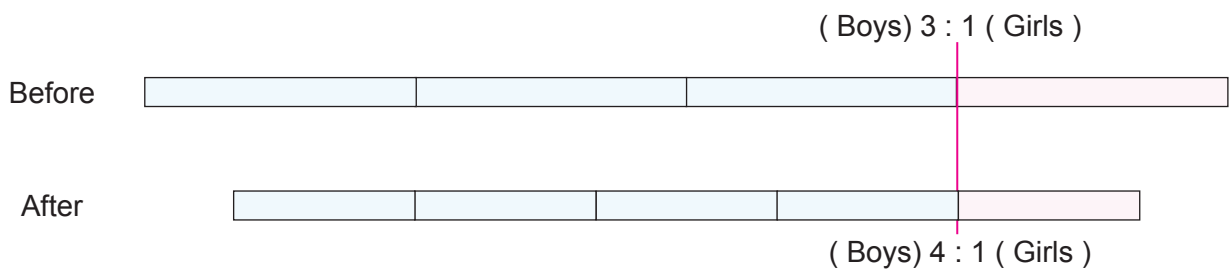
Example 4

At first, the ratio of the number of boys to the number of girls in a chess club was 3 : 1. After 5 boys and 5 girls left the club, the ratio became 4 : 1.

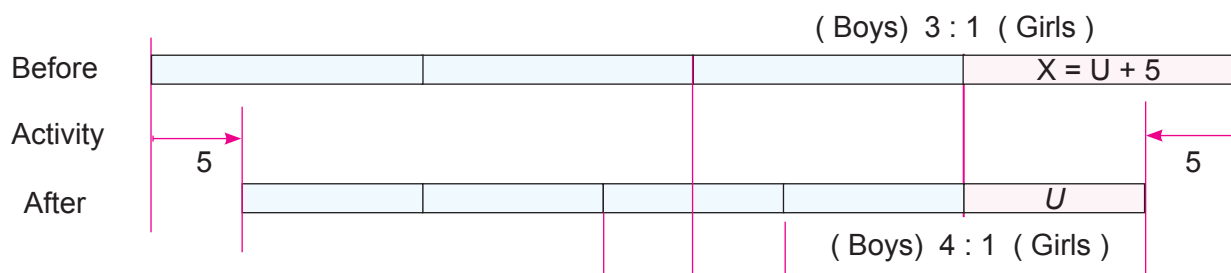
In the end, how many girls were there in the club?

Solution

Step 1 : Construct the bar model to depict the ratio situations.



Step 2 : Add the activity that 5 boys and 5 girls left the club. Obtain the algebraic relation $X = U + 5$.



Step 3 : Computations

$$U = 5 + 5 = 10$$

In the end, there were 10 (= U) girls

Exercise PSLE (09/02/19)