JIMMY Maths

Understanding the Equal Fractions Concept

The Equal Fractions Concept is a must-know in PSLE Math. It's important for your child to know how and when to apply equal fractions.

In this tutorial, the key concept is a common numerator. So, using equal fractions allows students to convert numerators of different fractions into the same number.

We apply the Common Numerator method when there are two or more sets of equal fractions. A simple example would be "$\frac{1}{3}$ **of the apples is equal to** $\frac{2}{3}$ **of the oranges**," which denotes equal fractions.

The common numerator method can help students shave precious minutes usually taken to complete a question.

In this tutorial, we're showing you a few challenging questions from 2021 Prelim papers and ways to apply the equal fractions concept.

Example 1

This question is taken from a Nanyang Primary School Prelim Paper 2 and is worth 3 marks.

Jinrong had a total of 304 chicken pies and blueberry pies at first. After giving away an equal number of each type of pie, she had $\frac{1}{3}$ of the chicken pies and $\frac{2}{5}$ of the blueberry pies left. How many blueberry pies were left? (3m)

> **Key Concept: Common Numerator**
>
> Since Jinrong gave away the same no. of CP and BP, $\frac{2}{3}$ of CP = $\frac{3}{5}$ of BP
>
> Apply Common Numerator to make 2u of CP and 3u of BP the same no. of units

Since Jinrong had $\frac{1}{3}$ of the chicken pies (CP) and $\frac{2}{5}$ of the blueberry pies left, then $\frac{2}{3}$ of the chicken pies and $\frac{2}{5}$ of the blueberry pies given away are the same. This means that we have equal fractions.

Step 1: Visualisation

To help your child visualise the question, you can draw a model first.

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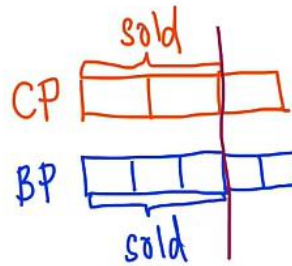
The 2 units of chicken pies sold is the same as the 3 units of blueberry pies sold. So, the primary focus in the bar model is only the part of the fractions indicating units sold because those units are equal fractions.

In these types of questions, we typically find the lowest common multiple. Then, we split the models such that there is the same number of units.

It is very easy to split the bars above into 6 units each. However, some fractions might be much bigger, and the splitting would be time-consuming.

Students could miscalculate or draw the wrong number of parts in the model and get the question wrong. The splitting process is also very time-consuming, even with fewer units. We can speed up this process by using the common numerator method instead.
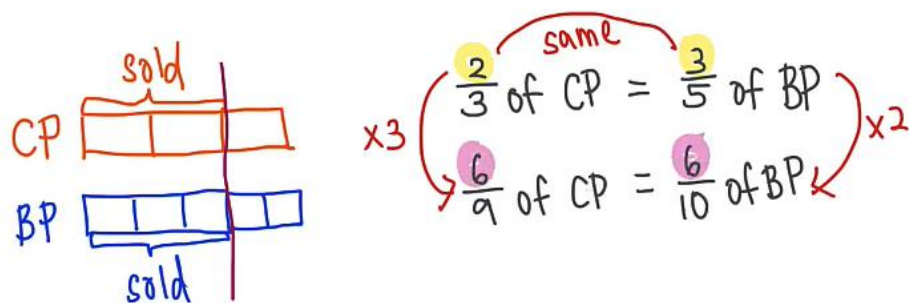
Step 2: Find the common numerator

First, write the two sets of equal fractions. In this example, a common numerator means 2 units of CP is the same as 3 units of BP. Therefore, we need to convert the numerators to the same value.
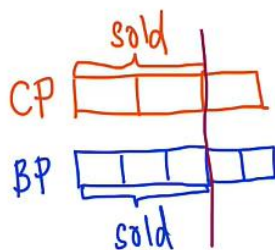

To find a common numerator, multiply the entire CP fraction by 3 and the entire BP fraction by 2. The numerator will then be 6 on both sides.

Step 3: Fraction comparison

Now that the numerators are the same, we can compare these two equal fractions on the same scale. That means there were 9 units of chicken pies and 10 units of blueberry pies at first. Therefore, there were 19 units (19u) of pies in total.

$$9 + 10 = 19u$$
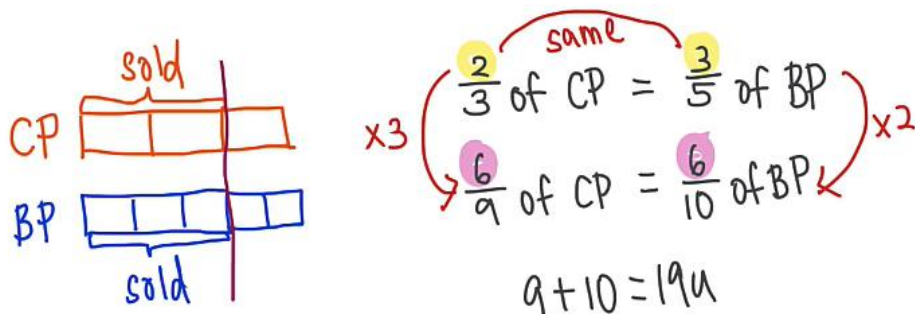
As stated in the question, this 19u is 304. Therefore, the next step is finding the exact value of 1 unit (1u). We do so by dividing 304 by 19, which gives us 16.

$$9 + 10 = 19u$$
$$19u = 304$$
$$1u = 16$$
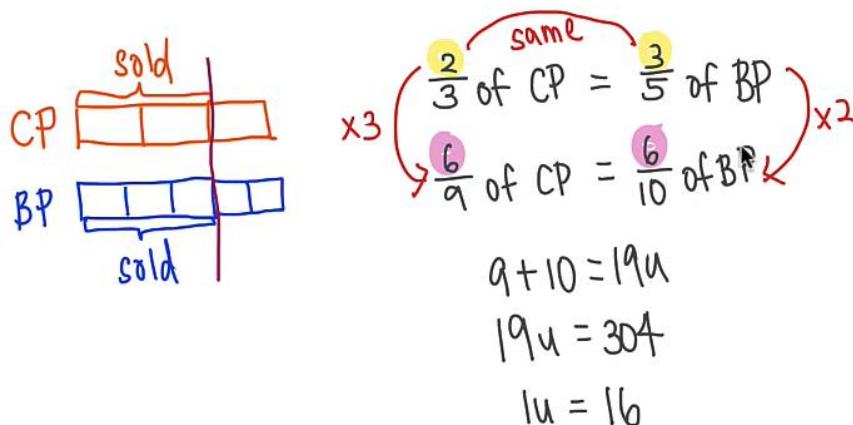
The question asked for the number of blueberry pies left.
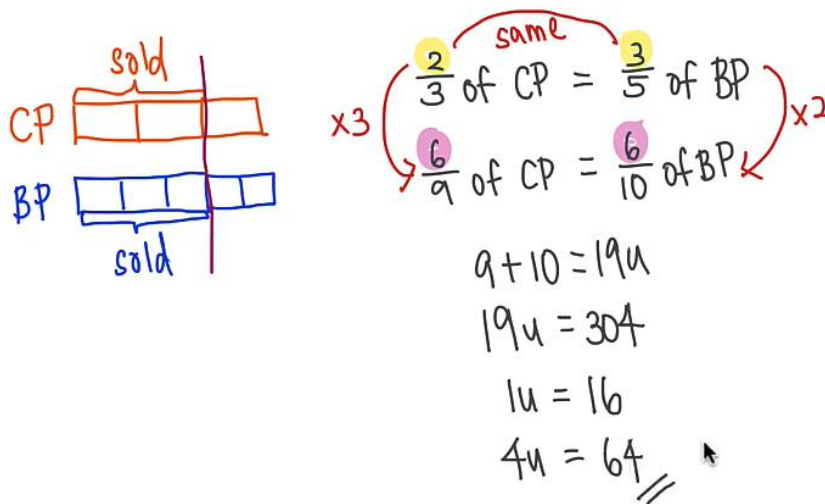
The number of blueberry pies left would be 4 units (4u), since 6 out of 10 units have been sold. The number of blueberry pies left would therefore be 16 × 4 = 64, and that is the final answer to this question.

Example 2

This question was taken from the Catholic High School Prelim Paper 2 and is worth 3 marks.

Catholic High School 2021 Prelim Paper 2 Q14

Mrs Lim prepared 160 chicken wings and some nuggets for a party. During the party, an equal number of chicken wings and nuggets were eaten. 25% of the chicken wings and 20% of the nuggets were left. How many nuggets did Mrs Lim prepare for the party? (3m)

> **Key Concept: Common Numerator**
>
> Since the same no. of CW and nuggets were eaten, 75% of CW = 80% of nuggets
> Convert these percentages to fraction so we can apply Common Numerator
> to make 75% of CW and 80% of nuggets the same no. of units

The keywords in this question are "**an equal number of chicken wings and nuggets were eaten.**" That means there are equal fractions of chicken wings eaten and nuggets eaten.

Since 25% of the chicken wings and 20% of the nuggets were left, then 75% of the chicken wings and 80% of the nuggets were eaten.

Step 1: Convert percentages to fractions

To easily apply the common numerator method, you'll need to convert the percentages into fraction form. The simplest form of 75% is $\frac{3}{4}$ and that of 80% is $\frac{4}{5}$.

So, $\frac{3}{4}$ of the chicken wings is actually the same as $\frac{4}{5}$ of the nuggets.

Step 2: Find the common numerator

3 units (3u) of the chicken wings and 4 units (4u) of the nuggets are equal fractions. However, this is not reflected in the number of units. To make these 2 numbers the same, you must find the common numerator.

The lowest common multiple of 3 and 4 is 12. So, multiply the entire CW fraction by 4 and the entire N fraction by 3 to find the common nominator.

Make sure you multiply both the numerator and the denominator because the goal is not to change the value or proportion of the fraction.

Step 3: Fraction comparison

Now that the numerator is the same, you can compare these two fractions on the same scale. This means 1 unit of chicken wings is now the same as 1 unit of nuggets.

The question states that 160 chicken wings were prepared at first. That would mean 16 units (16u) of chicken wings is 160. One unit (1u) would then be $\frac{160}{16} = 10$.

$$75\% = \frac{3}{4} \quad \text{same} \quad 80\% = \frac{4}{5}$$

$$\times 4 \left(\begin{array}{c} \frac{3}{4} \text{ of CW} = \frac{4}{5} \text{ of N} \\ \frac{12}{16} \text{ of CW} = \frac{12}{15} \text{ of N} \end{array} \right) \times 3$$

$$16u = 160$$
$$1u = 10$$

The question asked for the number of nuggets Mrs. Lim prepared for the party.

$$75\% = \frac{3}{4} \quad \text{same} \quad 80\% = \frac{4}{5}$$

$$\times 4 \left(\begin{array}{c} \frac{3}{4} \text{ of CW} = \frac{4}{5} \text{ of N} \\ \frac{12}{16} \text{ of CW} = \frac{12}{15} \text{ of N} \end{array} \right) \times 3$$

$$16u = 160$$
$$1u = 10$$
$$15u = 150$$

The original number of nuggets is 15 units (15u). Therefore, 15u × 10 would give us 150, and that's the final answer to this question.

The equal fractions concept is much faster than drawing a model, splitting every unit into equal parts, and then counting them one-by-one to find the total units of each item.

I hope this tutorial was helpful and easy to follow. If you have any questions or suggestions, please leave them in the comments. You can also watch the full video tutorial here:
https://www.youtube.com/watch?v=kQk_-4TUNmw&t=27s

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Ms Elaine Wee
Math and Science Specialist
Jimmy Maths and Grade Solution Learning Centre

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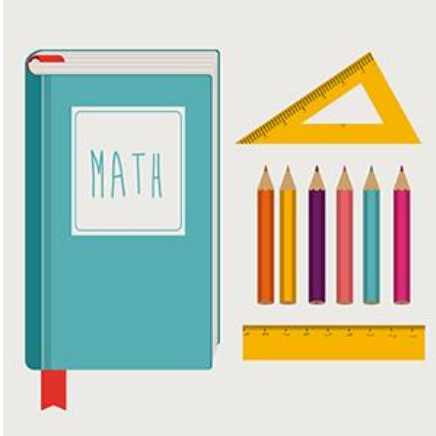- 24/7 Homework Helper Service

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