

## Understanding common denominators

These sheets show in diagram form what happens when you are adding two fractions with different denominators

Consider:  $\frac{5}{6} + \frac{3}{4}$

For first fraction the denominator tells us that the whole has been chopped up into 6 parts.



we are considering only 5 parts of the whole for the first fraction



For second fraction the denominator tells us that the whole has been chopped up into 4 parts.



we are considering only 3 parts of the whole for the second fraction

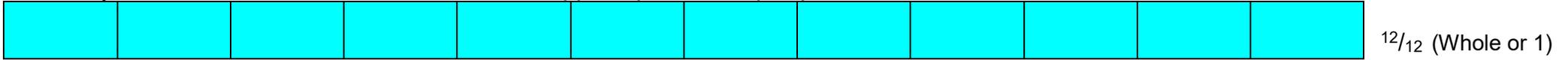


So the problem is how to add the parts of the first fraction to the parts of the second fraction when the size of the parts are different.

What you need to do is chop up each fraction quantity into parts that are of the same size, to do this you find a number that both denominators (6 and 4) will go into, in this case the number will be 12.

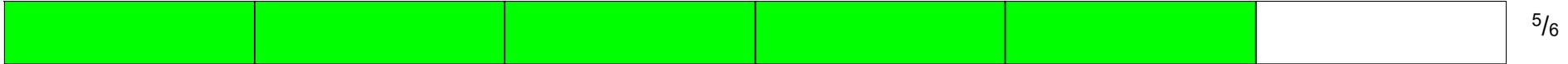
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So now you start off with a whole that has been chopped up into 12 equal parts



Now you must represent each of the two fractions above in terms of the smaller parts

The first fraction is  $5/6$



The denominator of this fraction has been multiplied by 2 to increase it to 12, therefore the numerator must be multiplied by 2 to give 10, so that the overall fraction value remains the same.

$$\frac{5 \times 2}{6 \times 2} = \frac{10}{12}$$

The first fraction  $5/6$  is equal to 10 of the smaller parts  $10/12$



The second fraction is  $3/4$



The denominator of this fraction has been multiplied by 3 to increase it to 12, therefore the numerator must be multiplied by 3 to give 9, so that the overall fraction value remains the same.

$$\frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

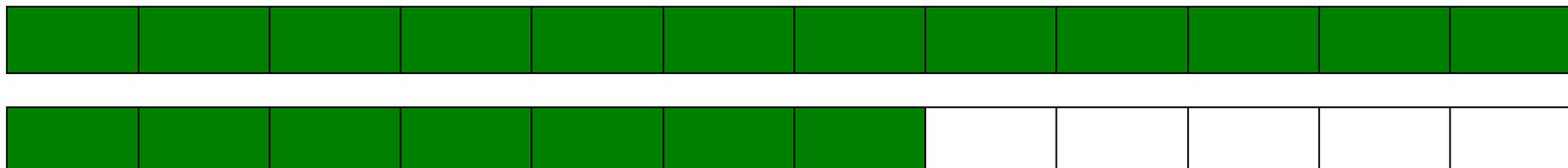
The second fraction  $3/4$  is equal to 9 of the smaller parts ( $9/12$ )



## Understanding common denominators

The original fraction can now be written in terms of the smaller parts

$\frac{5}{6} + \frac{3}{4} = \frac{10}{12} + \frac{9}{12} = \frac{19}{12}$ , so in total after adding both fractions you now have 19 of the smaller parts



$\frac{19}{12}$  is a top-heavy fraction, dividing the numerator (top number) by the denominator (bottom number) gives 1 remainder 7 or  $1 \frac{7}{12}$

$$\text{Therefore } \frac{5}{6} + \frac{3}{4} = 1 \frac{7}{12}$$