Year 6 Fractions

$\frac{3}{16} + \frac{5}{8} =$

1 mark

$2\frac{5}{6} - \frac{3}{4} =$

1 mark

$\frac{1}{3} + \frac{2}{6} + \frac{5}{18} =$

1 mark

$\frac{2}{7} \times \frac{5}{9} =$

1 mark

$\frac{2}{7} - \frac{1}{9} =$

1 mark

$\frac{1}{3} \div 6 =$

1 mark

$\frac{2}{3} + 2\frac{1}{3} =$

1 mark

$1 - \square = \frac{7}{10}$

1 mark

Adding and subtracting fractions

Common denominators

It's easy to add and subtract fractions when the numbers on the bottom are the same.

These are called the denominators.

$\frac{2}{9} + \frac{5}{9} = \frac{7}{9}$

Equivalent fractions

However, sometimes the denominators are different.

$\frac{1}{2} + \frac{1}{3} = ?$

You can use **equivalent fractions** to make them the same.

A common multiple of 2 and 3 is 6.

So, for each fraction we need an equivalent fraction with a denominator of 6.

To find the equivalent fraction for $\frac{1}{2}$ we need to multiply the numerator and denominator by 3.

$\frac{1}{2} = \frac{3}{6}$

And to find the equivalent fraction for $\frac{1}{3}$ we must multiply the numerator and denominator by 2.

$\frac{1}{3} = \frac{2}{6}$

Now the denominators are the same we can add them together.

$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

How to add mixed numbers

When adding mixed numbers, you can use a similar method to adding two fractions, but this time you have to add whole numbers as well.

Remember, a mixed number is a combination of an integer (a whole number) and a fraction, like $3\frac{1}{3}$.

Example 1

What is $1\frac{1}{3} + 2\frac{2}{9}$?

Let's break this calculation down into steps. The met
below allows you to partition the mixed numbers int
fractions and whole numbers, so that you can add th
separately.

Step 1: Partition the mixed numbers, so you are left with the whole numbers together and the fractions together.

$1+2$

and

$\frac{1}{3}+\frac{2}{9}$

You can quickly add the whole numbers together to make 3.

$1+2=3$

Step 2: Focus on the fractions now.

$\frac{1}{3}+\frac{2}{9}=?$

The fractions have different denominators, so you need to change one into its **equivalent fraction** before you add them.

You can't simplify $\frac{2}{9}$ any further, so you will have to change $\frac{1}{3}$.

$\frac{1}{3}=\frac{3}{9}$

By multiplying the numerator and denominator by 3, you can find an equivalent fraction.

Step 3: Now that the denominators are the same, you can add the numerators together.

$\frac{3}{9}+\frac{2}{9}=\frac{5}{9}$

Step 4: Finally, add the answers from the whole numbers and fractions together.

$3+\frac{5}{9}=3\frac{5}{9}$

Example 2

Jeannie and Oliver ordered lots of pizzas. Jeannie ate $2\frac{1}{4}$ pizzas and Oliver ate $1\frac{1}{8}$. How much pizza did they eat altogether?

Let's write that as a calculation.

$2\frac{1}{4}+1\frac{1}{8}$

Step 1: Partition the fractions and whole numbers to add them separately.

$2+1=3$

and

$\frac{1}{4}+\frac{1}{8}$

Step 2: Change one of the fractions so they both have the same denominator.

$\frac{1}{4}=\frac{2}{8}$

Step 3: Add the numerators together.

$\frac{2}{8}+\frac{1}{8}=\frac{3}{8}$

Step 4: Add the whole number answer and fraction answer together.

$3+\frac{3}{8}=3\frac{3}{8}$

So Jeannie and Oliver ate $3\frac{3}{8}$ pizzas.

Subtracting mixed numbers

When subtracting mixed numbers, you can use a similar method to subtracting two fractions, but this time you have to subtract whole numbers as well.

Remember, a mixed number is a combination of an integer (a whole number) and a fraction, like $3\frac{1}{2}$.

Let's have a look at **two** methods for subtracting mixed numbers.

Method 1

Partition the mixed numbers into fractions and whole numbers, and then subtract them separately.

Example 1

Solve

$$5\frac{2}{3} - 2\frac{2}{9}$$

Step 1: Partition the mixed numbers so you have whole numbers together and the fractions together.

$$\frac{2}{3} - \frac{2}{9}$$

and

$$5 - 2$$

Subtract the whole numbers.

$$5 - 2 = 3$$

Step 2: Change one of the fractions into an **equivalent fraction** so both fractions have the same denominator.

You can't simplify $\frac{2}{9}$ any further so you have to change $\frac{2}{3}$. 3 is a factor of 9 so multiply the numerator and denominator by 3.

$$\frac{2}{3} = \frac{6}{9}$$

Step 3: Subtract the numerator.

$$\frac{6}{9} - \frac{2}{9} = \frac{4}{9}$$

Step 4: Put the two answers from the whole numbers and fractions back together:

$$3 + \frac{4}{9} = 3\frac{4}{9}$$

Therefore:

$$5\frac{2}{3} - 2\frac{2}{9} = 3\frac{4}{9}$$

Method 2

Change the mixed numbers into **improper fractions**.

Remember, an improper fraction is a fraction where the numerator is greater than the denominator, like $\frac{9}{5}$.

Example 2

Solve

$$2\frac{1}{5} - 1\frac{5}{25}$$

Step 1: Convert the fractions so that they have the same denominator.

The denominators are 5 and 25.

5 goes into 25, so $\frac{5}{25}$ is equivalent to $\frac{1}{5}$.

$$1\frac{5}{25} = 1\frac{1}{5}$$

Step 2: Convert the mixed numbers into **improper fractions**.

To do this, multiply the integer (whole number) by the denominator, and then add that to the numerator.

$$2\frac{1}{5} - 1\frac{1}{5}$$

becomes

$$\frac{11}{6} - \frac{6}{5}$$

Step 3: Subtract the numerators.

$$\frac{11}{5} - \frac{6}{5} = \frac{5}{5}$$

$\frac{5}{5}$ is one whole, so it can be written as **1**. So:

$$2\frac{1}{5} - 1\frac{5}{25} = 1$$

Example 3

Solve

$$3\frac{1}{9} - 1\frac{4}{9}$$

Which method would be best?

Method 1 would need you to subtract $\frac{4}{9}$ from $\frac{1}{9}$. This is difficult to solve as it involves exchange.

As the denominators are the same, it is easier to use **Method 2**. Convert the mixed numbers into improper fractions.

$$3\frac{1}{9} = \frac{28}{9}$$

and

$$1\frac{4}{9} = \frac{13}{9}$$

Subtract the numerators.

$$\frac{28}{9} - \frac{13}{9} = \frac{15}{9} = 1\frac{6}{9}$$

Divide fractions by integers

To divide fractions by a whole number, we **divide the numerator** by the whole number and the **denominator stays the same**.

Example 1

This jug of juice is $\frac{4}{5}$ full and we need to share it out between two cups.

How much will be in each cup?

The calculation is $\frac{4}{5} \div 2$.

We know that **4 ÷ 2 = 2** so we can use that knowledge here.

You can visualise what $\frac{4}{5}$ looks like with these bar models and how that is split between two.

To work this out without using images we divide the numerator by the whole number and keep the denominator the same.

$\frac{4}{5} \div 2 = \frac{2}{5}$.

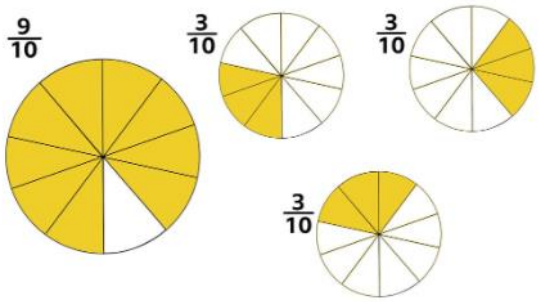
Example 2

There is $\frac{9}{10}$ of a pizza left and we need to share it equally between 3 people.

As a fraction, how much pizza will each person receive?

As a calculation this is $\frac{9}{10} \div 3$

Let's take a look at this problem visually.



We started with $\frac{9}{10}$ and then shared out the $\frac{9}{10}$ to 3 people.

9 ÷ 3 = 3 so each person gets $\frac{3}{10}$

Another way to work this out without using a diagram is to divide the numerator by the whole number and keep the denominator the same.

$\frac{9}{10} \div 3 = \frac{3}{10}$.

Multiplying fractions

To multiply fractions, you need to multiply the numerators together and multiply the denominators together.