

How do we do Fractions at Netherbrook?



Simplify (Cancel)

12/24 can be simplified as both numbers can be divided by 12

12 divided by 12 is $\underline{1}$

24 divide by 12 is 2 so this simplifies to $\frac{1}{2}$

Order Fractions

If they have the same denominator order using the numerator:

$\frac{1}{6}$ $\frac{3}{6}$ $\frac{7}{6}$ $\frac{4}{6} = \frac{1}{6}$ $\frac{3}{6}$ $\frac{4}{6}$ $\frac{7}{6}$

If they have different denominators, change them to a common denominator:

$\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{10}$ Changes to $\frac{\quad}{20}$ as this is the smallest number they all divide into

$\frac{1}{4} = \frac{5}{20}$ $\frac{1}{5} = \frac{4}{20}$ $\frac{1}{10} = \frac{2}{20}$ This means we can order them

$\frac{1}{10}$ $\frac{1}{5}$ $\frac{1}{4}$ (See adding fractions for more advice)

Fractions of amounts

Finding fractions of amounts

The **denominator** tells us how many parts to divide into.

Finding $\frac{1}{5}$ of an amount is the same as dividing that amount by 5.

So $\frac{1}{5}$ of 30 = 6

$30 \div 5 = 6$

Diagram: A bar divided into 5 equal parts. The first part is shaded purple. Labels: 6, 30, 1, 1, $\frac{1}{5}$.

The **numerator** tells us how many parts we want.

If we're asked to find $\frac{3}{5}$ of an amount, we need 3 parts.

If $\frac{1}{5}$ of 30 = 6

Then $\frac{3}{5}$ of 30 = 18

$6 \times 3 = 18$

Diagram: A bar divided into 5 equal parts. The first three parts are shaded green. Labels: 6, 12, 18, 30, 1, 1, 1, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$.

Divide by the bottom
Then times by the top!

Adding and subtracting Fractions (Change to common denominator)

Example: What is $\frac{1}{6} + \frac{7}{15}$?

The Denominators are 6 and 15:

multiples of 6: 6, 12, 18, 24, 30, 36, ...

multiples 15: 15, 30, 45, 60, ...

So the **Least Common Multiple** of 6 and 15 is **30**.

Now let's try to make the denominators the same.

Note: what we do to the bottom of the fraction,
we must also do to the top

For the first fraction we can multiply top and bottom by 5 to get a denominator of 30:

$$\begin{array}{c} \times 5 \\ \curvearrowright \\ \frac{1}{6} = \frac{5}{30} \\ \curvearrowleft \\ \times 5 \end{array}$$

For the second fraction we can multiply top and bottom by 2 to get a denominator of 30:

$$\begin{array}{c} \times 2 \\ \curvearrowright \\ \frac{7}{15} = \frac{14}{30} \\ \curvearrowleft \\ \times 2 \end{array}$$

Now we can do the addition by adding the top numbers:

$$\text{So } 5/30 + 14/30 = 19/30$$

Subtraction is the same but you would just subtract your fractions

Adding and Subtracting Fractions – Butterfly method

$$\frac{2}{5} + \frac{3}{7} = \frac{29}{35}$$

Adding and subtracting mixed numbers

$$3 \frac{2}{9} + 1 \frac{2}{3} = \frac{29}{9} + \frac{15}{9} = \frac{44}{9}$$
$$= 4 \frac{8}{9}$$

Multiply Fractions

If you multiply two proper fractions together, the product is less than either of them:

$$\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$$

of means \times

$$\frac{1}{2} \text{ of } \frac{3}{4} = \frac{3}{8}$$
$$\frac{3}{4} \text{ of } \frac{1}{2} = \frac{3}{8}$$

To multiply simply times the numbers at the top, then times the numbers at the bottom, you may have to simplify

$$\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$$

$$\frac{6}{7} \times \frac{7}{9} = \frac{42}{63}$$

Simplify before multiplying

$$\overset{1}{\cancel{6}} \times \frac{5}{\underset{1}{\cancel{6}}} = \frac{1 \times 5}{7 \times 1} = \frac{5}{7}$$

$$\overset{1}{\cancel{4}} \times \frac{3}{\underset{2}{\cancel{8}}} = \frac{1 \times 3}{5 \times 2} = \frac{3}{10}$$

$$\frac{4}{\underset{3}{\cancel{9}}} \times \overset{2}{\cancel{6}} = \frac{4 \times 2}{3 \times 7} = \frac{8}{21}$$

Multiplying mixed numbers.

$$2\frac{2}{5} \times \frac{1}{2} = \frac{12}{5} \times \frac{1}{2} = \frac{12}{10} = \frac{6}{5} = 1\frac{1}{5}$$

1. Change the mixed number to an improper fraction.
2. Multiply as before.
3. Cancel down and change to mixed number if necessary.

Multiplying fractions and whole numbers

$$12 \times \frac{5}{6} = \frac{12}{1} \times \frac{5}{6} = \frac{60}{6} = 10$$

1. Whole numbers have a denominator of 1.
2. Multiply numerators and denominators.
3. Cancel down and change to a mixed number if necessary.

Divide Fractions

KEEP the first fraction
CHANGE the divide sign
to multiply
FLIP the second fraction

$$\frac{3}{4} \div \frac{5}{8} = \frac{3}{4} \times \frac{8}{5} = \frac{24}{20} = 1\frac{4}{20} \text{ or } 1\frac{1}{5}$$

Dividing mixed numbers.

$$2\frac{2}{5} \div \frac{1}{2} = \frac{12}{5} \div \frac{1}{2} = \frac{12}{5} \times \frac{2}{1} = \frac{24}{5} = 4\frac{4}{5}$$

1. Change the mixed number to an improper fraction.
2. Divide as before.
3. Cancel down and change to a mixed number if necessary.

Dividing fractions and whole numbers

$$8 \div \frac{3}{5} = \frac{8}{1} \times \frac{5}{3} = \frac{40}{3} = 13\frac{1}{3}$$

1. Whole numbers have a denominator of 1.
2. Turn dividing fraction upside down and multiply numerators and denominators.
3. Cancel down and change to a mixed number if necessary.

