Dereham Church of England

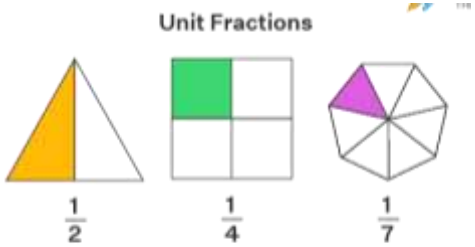
Fractions Appendix

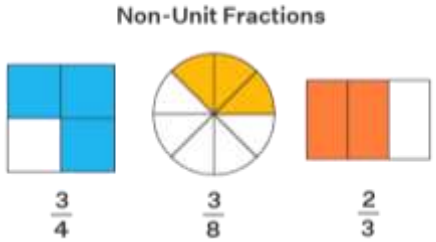
Proper fractions

This means that the fraction is below 1 or a whole. The denominator is bigger than the numerator.

Unit fractions

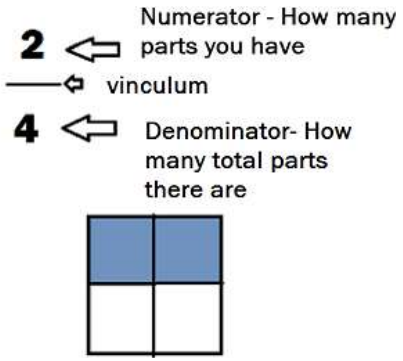
A unit fraction is any fraction with 1 as its numerator (top number), and a whole number for the denominator (bottom number).





Non-unit fractions

A non-unit fraction is a fraction with a number greater than one as its numerator (top number) and a whole number for the denominator (bottom number).

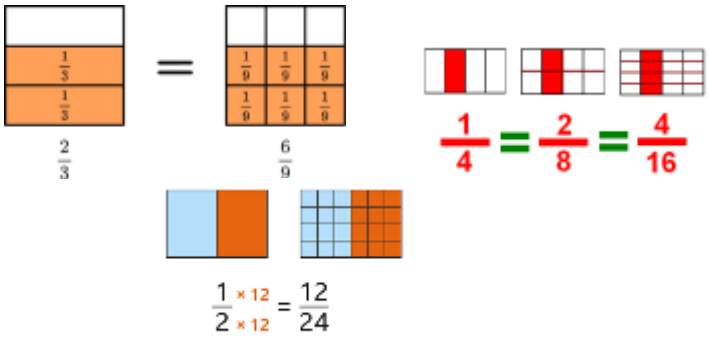


What is a fraction?

Fractions are used to represent smaller pieces (or parts) of a whole.
The parts might make up one thing, or more than one thing. Either way, altogether, they make up what's called a whole.

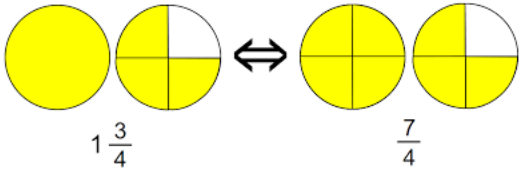
Equivalent fractions

Equivalent fractions are two or more fractions that are all equal. A fraction is a part of a whole: the denominator (bottom number) represents how many equal parts the whole is split into; the numerator (top number) represents the amount of those parts.



Mixed number and improper fractions

When you have a whole number and a fraction side by side, like 1 ½, it's called a mixed number. You can convert this into a fraction, but the numerator will be bigger than the denominator. In this case $\frac{3}{2}$. This is called an improper fraction.



Mixed number Improper fraction

Simplifying fractions

This just means that we use the lowest possible numbers when we work out our fractions. We do this to keep things simple – it stops us from ending up with fractions made up of huge numbers (which can be confusing). Simplifying fractions is another area which highlights the importance of children mastering their times tables.

- To write a fraction in **simplest form** or **lowest terms** follow these two steps:

1 – Find the Greatest Common Factor (GCF) of the numerator and denominator.

2 – Divide both the numerator and the denominator by the GCF.

Example: $\frac{12}{18}$ 12 – 1,2,3,4,**6**,12 $\frac{12}{18} \div \frac{6}{6} = \frac{2}{3}$
18 – 1,2,3,**6**,9,18

Year 3

Addition

$\frac{3}{8} + \frac{1}{8} = \frac{4}{8}$

"When adding fractions with the same _____ , I only add the _____."

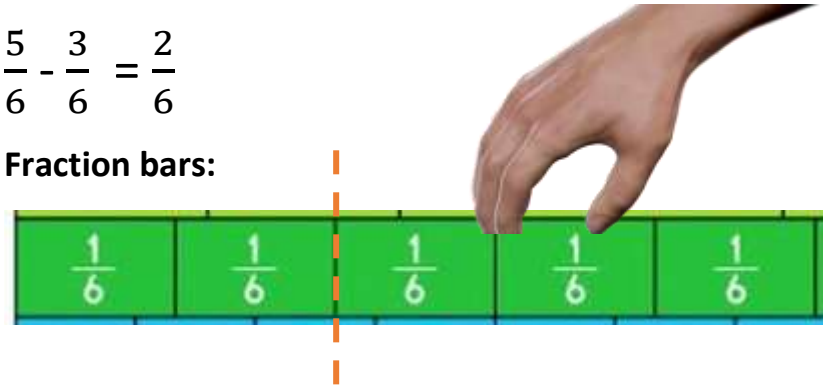
Fraction bars:

Bar model:

Subtraction

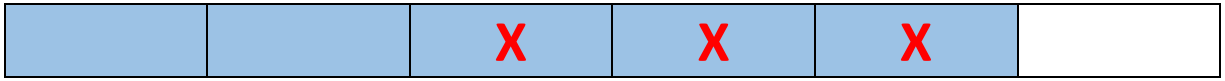
$\frac{5}{6} - \frac{3}{6} = \frac{2}{6}$

Fraction bars:



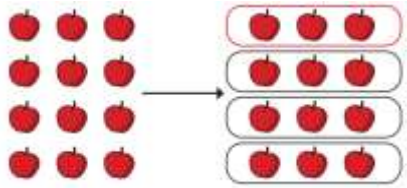
"When subtracting fractions with the same _____ , I only subtract the _____."

Bar model:



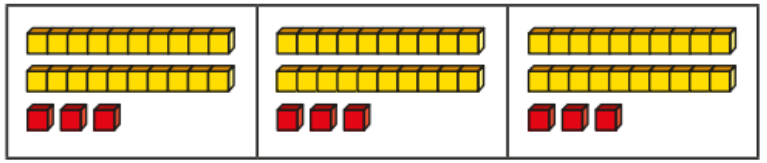
Fractions of a quantity

"The whole is divided into _____ equal parts. Each part is ____ of the whole."



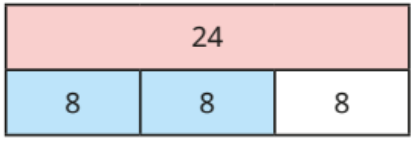
The whole is divided into 4 equal parts. Each part is $\frac{1}{4}$ of the whole.

Bar models:



$\frac{1}{3}$ of 69 = 23 $\frac{2}{3}$ of 69 = 46 $\frac{3}{3}$ of 69 = 69

$\frac{1}{3}$ of 36 = 12 $\frac{2}{3}$ of 36 = 24 $\frac{3}{3}$ of 36 = 36



$24 \div 3 = 8$

$\frac{1}{3}$ of 24 = 8

$8 \times 2 = 16$

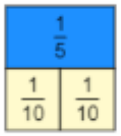
$\frac{2}{3}$ of 24 = 16

Year 4

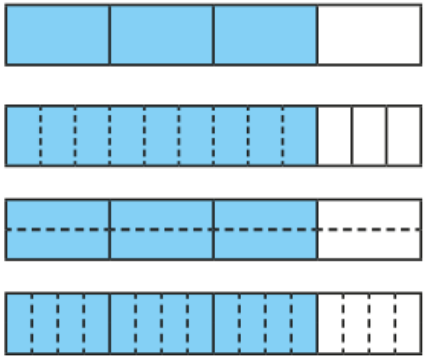
Finding equivalent fractions

Fraction bars

Mathsbot – fraction wall



Bar models



"I can divide each part into ____ equal parts to show that ____ is equivalent to ____ ."

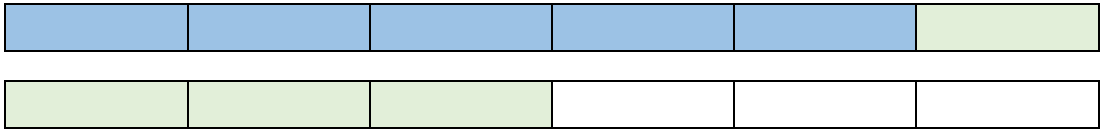
Adding fractions

$$\frac{5}{6}+\frac{4}{6}=\frac{9}{6}=1\frac{3}{6}$$

"When adding fractions with the same _____ , I only add the _____."

Fraction bars:

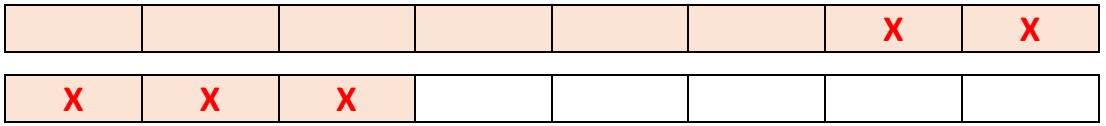
Bar model:



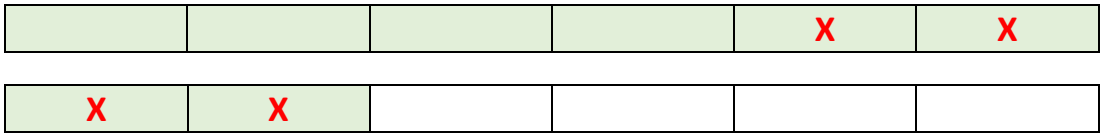
Subtracting fractions

$$\frac{11}{8}-\frac{5}{8}=\frac{6}{8}$$

"When subtracting fractions with the same _____ , I only subtract the _____."



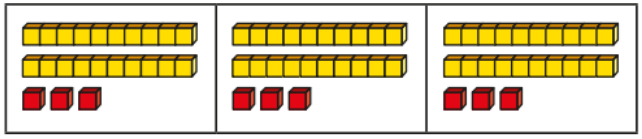
$$1\frac{2}{6}-\frac{4}{6}=1\frac{2}{6}-\frac{2}{6}-\frac{2}{6}=\frac{4}{6}$$



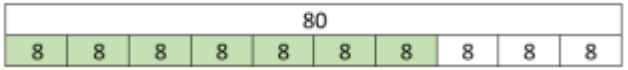
Finding fractions of an amount

"The whole is divided into _____ equal parts. Each part is ____ of the whole."

$\frac{1}{3}$ of 36 = 12 $\frac{2}{3}$ of 36 = 24 $\frac{3}{3}$ of 36 = 36



$\frac{1}{3}$ of 69 = 23 $\frac{2}{3}$ of 69 = 46 $\frac{3}{3}$ of 69 = 69



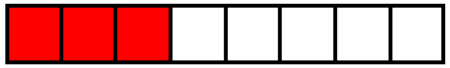
$\frac{1}{10}$ of 80 = 8 so $\frac{7}{10}$ of 80 = 56

80 ÷ 10 = 8 7 x 8 = 56

Year 5

Adding fractions

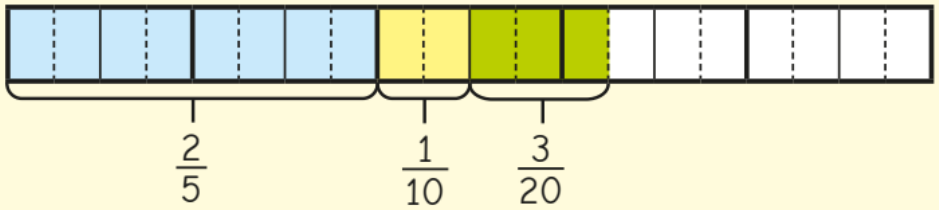
3/8 + 9/16



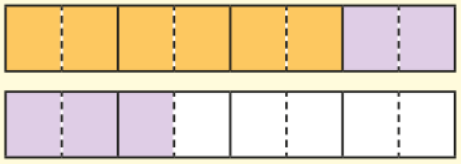
3/8 = 6/16

3/8 + 9/16 = 15/16

"When adding fractions with different denominators, I need to find a common denominator."

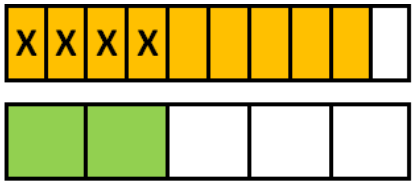


$$\frac{2}{5}+\frac{1}{10}+\frac{3}{20}=\frac{8}{20}+\frac{2}{20}+\frac{3}{20}=\frac{13}{20}$$



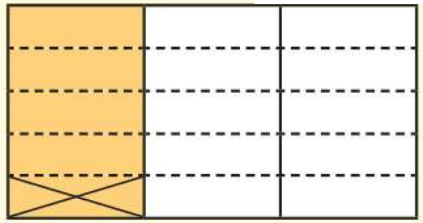
$$\frac{3}{4}+\frac{5}{8}=\frac{6}{8}+\frac{5}{8}=\frac{11}{8}=1\frac{3}{8}$$

Subtracting fractions



9/10 — 2 /5 = 5/10 = 1/2

"When subtracting fractions with different denominators, I need to find a common denominator."

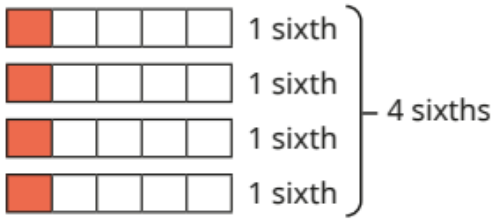


$$\frac{1}{3}-\frac{1}{15}=\frac{5}{15}-\frac{1}{15}=\frac{4}{15}$$

$$2\frac{3}{4}-\frac{7}{8}=2\frac{6}{8}-\frac{7}{8}=2\frac{6}{8}-\frac{6}{8}-\frac{1}{8}=1\frac{7}{8}$$

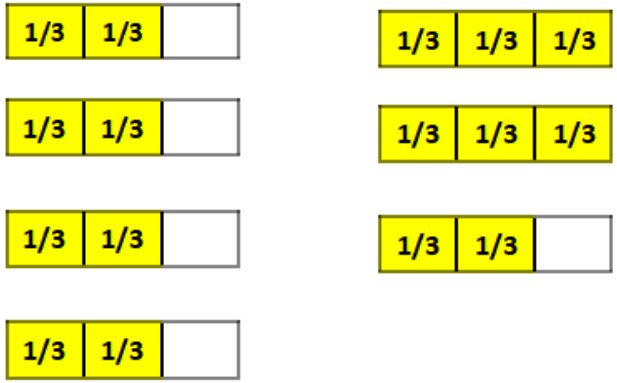
$$\times 2\left(\frac{7}{4}-\frac{3}{8}=\frac{11}{8}\right)\quad \frac{14}{8}$$

Multiplying fractions

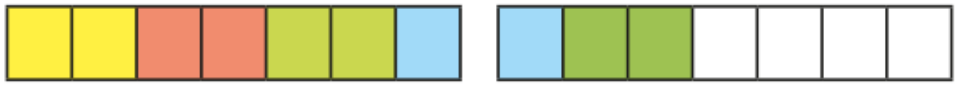


"To multiply a fraction by an integer, I multiply the _____ by the integer and the _____ remains the same."

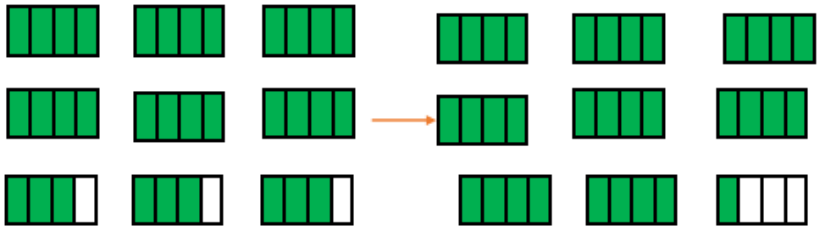
2/3 x 4 = 8/3 = 2 2/3



$\frac{2}{7} \times 5 = \frac{10}{7} = 1\frac{3}{7}$



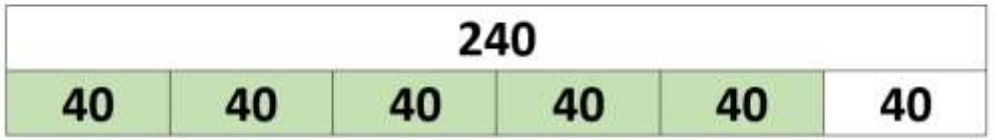
2 3/4 x 3 = 8 1/4



Finding fractions of an amount

"To find a fraction of an amount, I need to divide by the _____ and multiply the result by the ____."

$\frac{5}{6}$ of 240 = 200

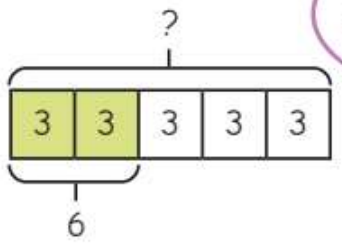


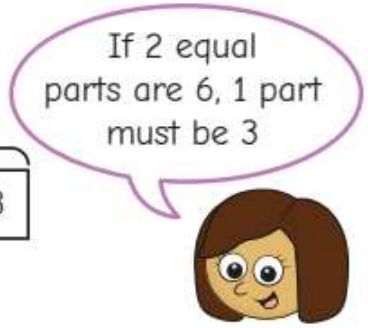
I know 6 x 4 = 24

So 240 ÷ 6 = 40 $\frac{1}{6}$ of 240 = 40 5 x 40 = 200

Finding the whole

$\frac{2}{5}$ of _____ = 6



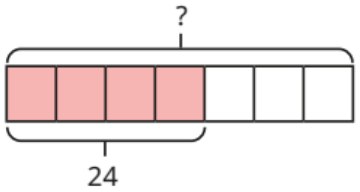


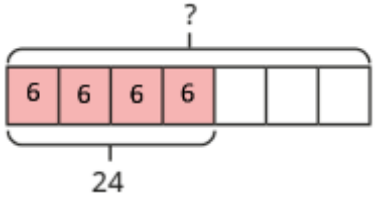
6 ÷ 2 = 3

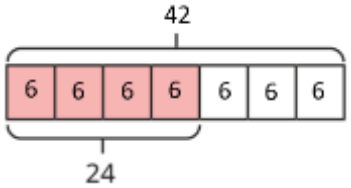
3 x 5 = 15

$\frac{2}{5}$ of 15 = 6

$\frac{4}{7}$ of ___ = 24







24 ÷ 4 = 6

1/7 = 6

7/7 = 7 x 6 = 42

Year 6

Adding and Subtracting fractions

$\frac{1}{3} + \frac{1}{4}$ Find a **common denominator**.

$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

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

"To add/subtract the fractions, I could convert them both to ____."

first common multiple of 9 and 2 is 18 $\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$

$1\frac{1}{2} + 2\frac{1}{6}$

$1 + 2 = 3$

$\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6} = \frac{4}{6}$

$3 + \frac{4}{6} = 3\frac{4}{6} = 3\frac{2}{3}$

OR

$1\frac{1}{2} + 2\frac{1}{6} = \frac{3}{2} + \frac{13}{6}$

$= \frac{9}{6} + \frac{13}{6}$

$= \frac{22}{6} = 3\frac{4}{6} = 3\frac{2}{3}$

$3\frac{3}{5} - 1\frac{7}{10}$

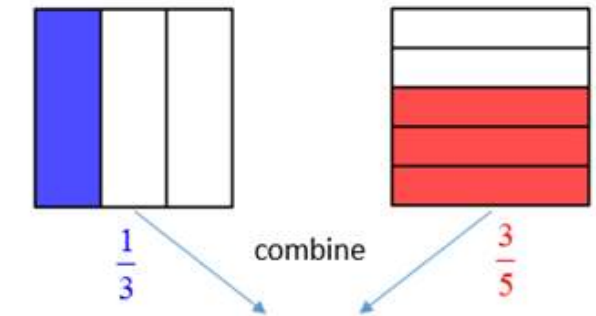
$3\frac{3}{5} - 1\frac{7}{10} = \frac{18}{5} - \frac{17}{10} = \frac{36}{10} - \frac{17}{10} = \frac{19}{10} = 1\frac{9}{10}$

OR

$3\frac{3}{5} = 2\frac{8}{5}$

$3\frac{3}{5} - 1\frac{7}{10} = 2\frac{8}{5} - 1\frac{7}{10} = 2\frac{16}{10} - 1\frac{7}{10} = 1\frac{9}{10}$

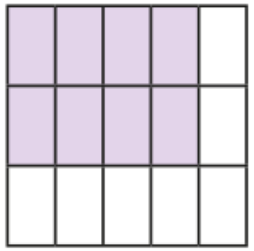
Multiplying fractions



$\frac{1}{3} \times \frac{3}{5} = \frac{3}{15} = \frac{1}{5}$

$\frac{1}{3} \times \frac{3}{5} = \frac{1}{3}$ of 3 fifths = 1 fifth

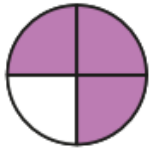
"When multiplying a pair of fractions, I need to multiply the _____ and multiply the _____ ."



$\frac{2}{3} \times \frac{4}{5} = \frac{2 \times 4}{3 \times 5} = \frac{8}{15}$

$\frac{3}{4} \times \frac{1}{5} = \frac{3}{20}$ $\frac{4}{5} \times \frac{3}{7} = \frac{12}{35}$ $\frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$

Dividing fractions



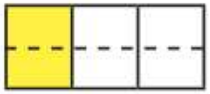
$\frac{3}{4} \div 3 = \frac{1}{4}$

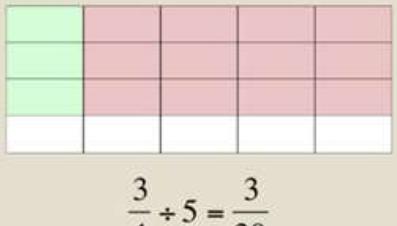
$\frac{4}{7} \div 4 = \frac{1}{7}$

$\frac{4}{7} \div 2 = \frac{2}{7}$

Each part is worth $\frac{1}{6}$

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





$\frac{3}{4} \div 5 = \frac{3}{20}$

"I am dividing each _____ by _____ so I must split each part into _____ equal parts."

$\frac{3}{4} \times \frac{1}{5} = \frac{3}{20}$

$\frac{6}{7} \div 2 = \frac{6}{7} \times \frac{1}{2} = \frac{6}{14}$

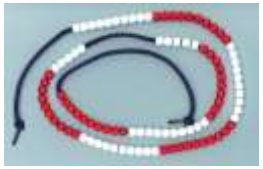
$\frac{1}{7} \div 2 = \frac{1}{14}$, so $\frac{6}{7} \div 2 = \frac{6}{14}$

$6 \div 2 = 3$, so $\frac{6}{7} \div 2 = \frac{3}{7}$

$\frac{2}{7} \div 2$

Percentages of amounts

"If 100% is equal to ____ , then ____% is equal to _____."



40% of 240

240									
24	24	24	24	24	24	24	24	24	24

10% of 240 = 24 so 4 x 24 = 80 + 16 = **96**

OR 120 – 24 = 96

11% of 250

10% of 250 = 25

1% of 250 = 2.5

11% of 250 = 25 + 2.5 = 27.5

60% of ___ = 4200

?									
700									

---------- 4200----------

4200 ÷ 6 = 700

If 60% = 4200, then 10% = 700. 700 x 10 = 7000

100% = 7000