Contents

This tells you which page you need.

The first page of a lesson is a maths problem. Don't look at the next page until you have had a go! The third and fourth pages give you practice, so you can check your understanding.

Multiplying a fraction by a whole number

Discover

1 **a)** The boat uses $\frac{1}{3}$ of a tank of fuel for each trip.

How many tanks of fuel are used in a day?

b) What is the total duration of the boat trips in a day?

Share

a) Each trip uses $\frac{1}{3}$ of a tank of fuel.

There are 5 trips in a day.

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

or

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

$1\frac{2}{3}$ tanks of fuel are used in a day.
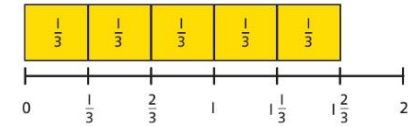
b) Each boat trip takes $1\frac{1}{4}$ hours and there are 5 trips a day.
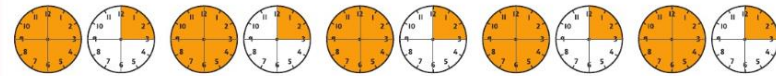
I can multiply the whole and the fraction separately and then add them.

I will convert the mixed number to an improper fraction first.

Method 1

$1 \times 5 = 5$

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

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

Method 2

$1\frac{1}{4} = \frac{5}{4}$

$\frac{5}{4} \times 5 = \frac{25}{4}$

$\frac{25}{4} = 6\frac{1}{4}$

The total duration of the boat trips in a day is $6\frac{1}{4}$ hours.

Multiplying a fraction by a whole number

1 a) Work out $\frac{1}{4} \times 7$.

$\frac{1}{4} \times 7 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

b) Work out $\frac{2}{5} \times 4$.

$\frac{2}{5} \times 4 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

c) Work out $\frac{2}{3} \times 6$.

$\frac{2}{3} \times 6 = \dfrac{\boxed{}}{\boxed{}} = \boxed{}$

2 Work out these multiplications.

a) $\frac{1}{2} \times 7 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

b) $\frac{4}{5} \times 3 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

c) $\frac{3}{8} \times 6 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

d) $\frac{7}{10} \times 5 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

3 Work out $1\frac{3}{5} \times 3$ in two different ways.

$1 \times 3 = \boxed{}$ and $1\frac{3}{5} = \dfrac{\boxed{}}{5}$

$\frac{3}{5} \times 3 = \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

$\dfrac{\boxed{}}{\boxed{}} \times 3 = \dfrac{\boxed{}}{\boxed{}}$

$\boxed{} + \boxed{} \dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

$\dfrac{\boxed{}}{\boxed{}} = \boxed{} \dfrac{\boxed{}}{\boxed{}}$

So $1\frac{3}{5} \times 3 = \boxed{} \dfrac{\boxed{}}{\boxed{}}$.

4 Work out these multiplications.

a) $\frac{11}{5} \times 6$

c) $2\frac{3}{4} \times 3$

b) $2\frac{1}{3} \times 8$

d) $6 \times 3\frac{2}{5}$

5 Kate says $\frac{2}{3} \times 4 = \frac{8}{12}$. What mistake has Kate made?

_____

_____

Multiplying a fraction by a fraction

Discover

We have $\frac{1}{2}$ a bag of oats.

We have $\frac{3}{4}$ of a block of butter.

1) Bella and Amal are making flapjacks.

a) They have $\frac{1}{2}$ a bag of oats. They need to use $\frac{1}{2}$ of the oats in the bag.

What fraction of a whole bag do they need to use?

b) They have $\frac{3}{4}$ of a block of butter.

They need $\frac{1}{2}$ of this to make the flapjack.

What fraction of a whole block do they need to use?

Share

a) There is $\frac{1}{2}$ a bag of oats.

Bella and Amal need to use $\frac{1}{2}$ of the oats in the bag.
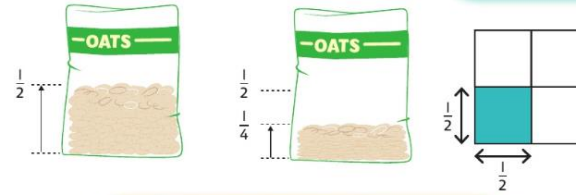
I used a grid. I labelled $\frac{1}{2}$ along the bottom and $\frac{1}{2}$ on the side. I shaded in the part of the grid where the $\frac{1}{2}$ labels lined up.
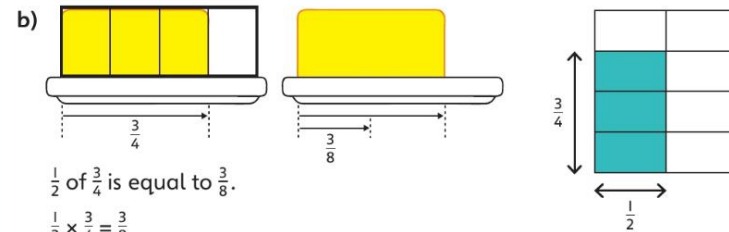

I think $\frac{1}{2}$ of $\frac{1}{2}$ means the same as $\frac{1}{2} \times \frac{1}{2}$.

$\frac{1}{2}$ of $\frac{1}{2}$ is equal to $\frac{1}{4}$.

Write this as $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$.

Bella and Amal need to use $\frac{1}{4}$ of a bag of oats.

b)

$\frac{1}{2}$ of $\frac{3}{4}$ is equal to $\frac{3}{8}$.

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

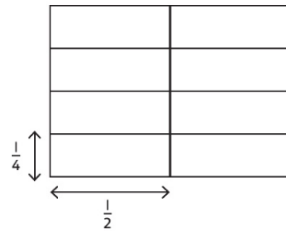Bella and Amal need to use $\frac{3}{8}$ of a block of butter.

Multiplying a fraction by a fraction

1 Zac is baking cookies.

a) The bag of flour is $\frac{1}{4}$ full. He uses $\frac{1}{2}$ of the flour in the bag.

What fraction of the whole bag does Zac use?

$\frac{1}{2} \times \frac{1}{4} = \boxed{}$
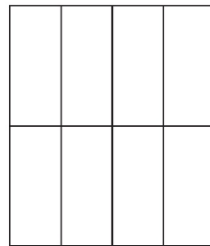
Zac uses $\boxed{}$ of the bag of flour.

b) The bag of chocolate chips is $\frac{1}{2}$ full.

Zac needs $\frac{3}{4}$ of the chocolate chips.
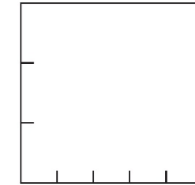
What fraction of the whole bag does he need?

$\boxed{} \times \boxed{} = \boxed{}$

Zac needs $\boxed{}$ of the bag.

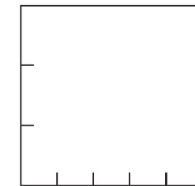**2** a) Complete the diagram to work out $\frac{1}{5} \times \frac{1}{3}$.
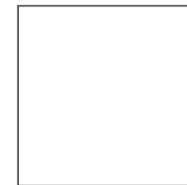
$\frac{1}{5} \times \frac{1}{3} = \boxed{}$

b) Complete the diagram to work out $\frac{2}{3}$ of $\frac{2}{5}$.

$\boxed{} \times \boxed{} = \boxed{}$

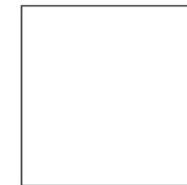**3** Draw diagrams to help you work out these calculations. Give each answer in its simplest form.

a) $\frac{3}{4} \times \frac{2}{5} = \boxed{}$

b) $\frac{2}{3}$ of $\frac{5}{6} = \boxed{}$

Dividing a fraction by a whole number

Discover


I have $\frac{4}{5}$ of the jug of juice left.

a) The jug is $\frac{4}{5}$ full of juice.

The juice is divided equally between the **2** empty cups.

What fraction of the original jug is in each of these cups?

b) $\frac{9}{10}$ of the jar of baby food will be enough for **3** equal meals.

What fraction of the jar of baby food should be put into each bowl?

Share

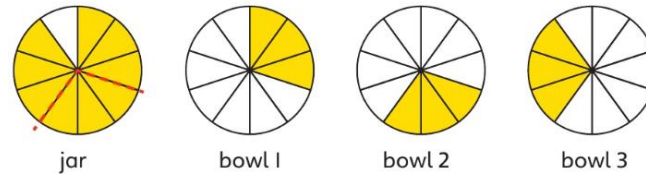**a)** There is $\frac{4}{5}$ of the jug to be shared equally between 2 cups.

I drew a diagram to represent the juice in the jug and then I divided this by 2. I can write this as a division.
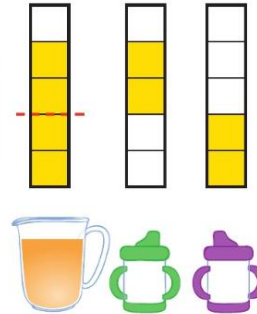
$\frac{4}{5} \div 2 = \frac{2}{5}$

$\frac{2}{5}$ of the original jug is in each cup.

b) There is $\frac{9}{10}$ of the jar to be shared equally into 3 bowls.

jar bowl 1 bowl 2 bowl 3

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

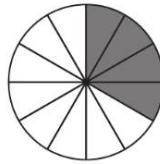$\frac{3}{10}$ of the jar of baby food should be put into each bowl.

Dividing a fraction by a whole number

1 This circle is divided into twelfths.

4 of the twelfths can be divided into 2 equal groups.

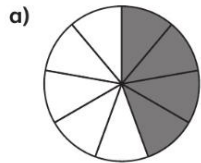How many twelfths are there in each group?

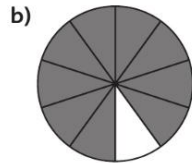There are ☐ twelfths in each group.

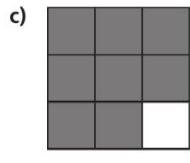Write this as a division.

$\frac{4}{12} \div 2 = \dfrac{\Box}{\Box}$

2 Use the diagrams to help you work out the divisions.

a)

b)

c)

$\frac{4}{9} \div 2 = \dfrac{\Box}{\Box}$

$\frac{9}{10} \div 3 = \dfrac{\Box}{\Box}$

$\frac{8}{9} \div 2 = \dfrac{\Box}{\Box}$

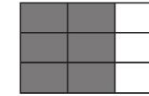**3** Work out these divisions.

a) $\frac{10}{11} \div 5 = \dfrac{\Box}{\Box}$

b) $\frac{4}{5} \div 4 = \dfrac{\Box}{\Box}$

4 Write a calculation for this diagram.

$\dfrac{\Box}{\Box} \div \Box = \dfrac{\Box}{\Box}$

5 Work out these divisions.

a) $\frac{5}{9} \div 5 = \dfrac{\Box}{\Box}$

c) $\frac{6}{7} \div 2 = \dfrac{\Box}{\Box}$

b) $\frac{3}{4} \div 3 = \dfrac{\Box}{\Box}$

d) $\frac{8}{15} \div 2 = \dfrac{\Box}{\Box}$

6 Complete these number sentences.

a) $\dfrac{\Box}{5} \div 2 = \frac{1}{5}$

c) $\frac{14}{15} \div \Box = \frac{2}{15}$

d) $\frac{40}{45} \div \Box = \frac{4}{45}$

$\dfrac{\Box}{5} \div 2 = \frac{2}{5}$

$\frac{14}{15} \div \Box = \frac{7}{15}$

$\frac{40}{45} \div \Box = \frac{5}{45}$

b) $\dfrac{\Box}{20} \div 3 = \frac{2}{20}$

$\frac{14}{15} \div \Box = \frac{1}{15}$

$\frac{40}{45} \div \Box = \frac{20}{45}$

$\dfrac{\Box}{20} \div 3 = \frac{5}{20}$

$\frac{14}{15} \div \Box = \frac{14}{15}$

$\frac{40}{45} \div \Box = \frac{8}{45}$

Calculating fractions of amounts

Discover

I a) The apples are shared into the baskets equally.

How many apples will the Year 6 children get?

b) The Year 6 children eat $\frac{3}{10}$ of their apples in the morning and the remaining apples in the afternoon.
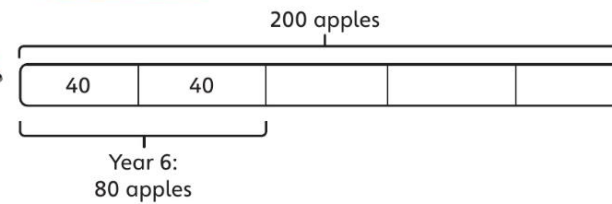
How many apples do they eat in the afternoon?

Share

a) There are 200 apples in the box.

The apples are shared equally between the baskets.

There are only 4 year groups, so will Year 6 receive $\frac{1}{4}$ of the apples, which is 50?

No, there are two baskets for Year 6, so the apples are shared between 5 baskets.

200 apples

| 40 | 40 | | | |

Year 6:
80 apples

The 200 apples are shared between 5 baskets.

$\frac{1}{5}$ of 200 = 200 ÷ 5 = 40

There are 2 baskets for Year 6. The Year 6 children will get $\frac{2}{5}$ of the apples.

$\frac{2}{5}$ of 200 = 2 × 40 = 80
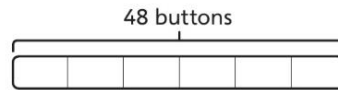
The Year 6 children will get 80 apples.

Calculating fractions of amounts

1. There are 48 buttons in a box. $\frac{5}{6}$ of the buttons are red and the rest are blue.

   48 buttons

   How many buttons are blue?

2. Andy won £720 in a competition. He gave $\frac{1}{3}$ of the money to his sister.

   How much money did he have left?

3. Kate and Ebo each bake 60 cookies for charity. Kate sells $\frac{2}{3}$ of her cookies. Ebo sells $\frac{7}{12}$ of his cookies.

   Who sells more cookies? How many more?

4. A box of chocolates costs £4·80. Sofia pays $\frac{4}{5}$ and Holly pays the rest.

   How much more does Sofia pay than Holly?

5. Work out these calculations.

   a) $\frac{9}{10}$ of 170 km = [ ] km

   c) $\frac{1}{7}$ of 0·35 km = [ ] _____

   b) $\frac{1}{5}$ of 3 hours = [ ] _____

   I wonder if I can change the units in parts b) and c).