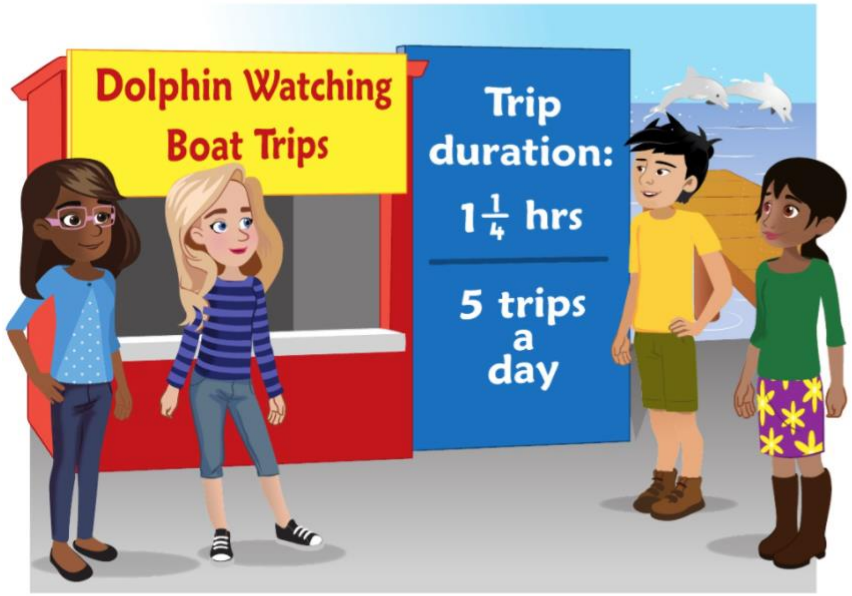
Monday 23rd

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

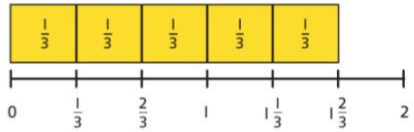
a) Each trip uses $\frac{1}{3}$ of a tank of fuel.

There are 5 trips in a day.

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

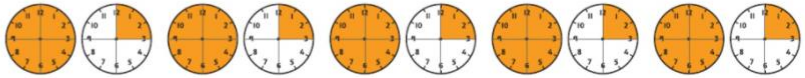
or

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



$1\frac{2}{3}$ 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	Method 2
$1\times 5=5$	$1\frac{1}{4}=\frac{5}{4}$
$\frac{1}{4}\times 5=\frac{5}{4}=1\frac{1}{4}$	$\frac{5}{4}\times 5=\frac{25}{4}$
$5+1\frac{1}{4}=6\frac{1}{4}$	$\frac{25}{4}=6\frac{1}{4}$

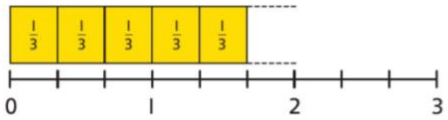
The total duration of the boat trips in a day is $6\frac{1}{4}$ hours.

Think together

1 On Saturday the boat makes 7 trips. It uses $\frac{1}{3}$ of a tank of fuel for each trip.

How many tanks of fuel are used on Saturday?

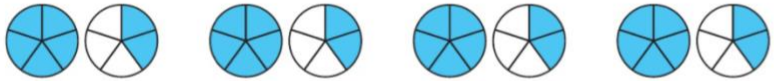
$\frac{1}{3} \times \square = \frac{\square}{\square} = \square\frac{\square}{\square}$



$\square\frac{\square}{\square}$ tanks of fuel are used.

2 A fishing boat offers fishing trips. During each trip the boat travels $1\frac{2}{5}$ km.

How far does the boat travel in 4 trips? Work out the answer using both methods.



Method 1

$\square \times 4 = \square$

$\frac{\square}{\square} \times 4 = \frac{\square}{\square} = \square\frac{\square}{\square}$

$\square + \square\frac{\square}{\square} = \square\frac{\square}{\square}$

Method 2

$\square\frac{\square}{\square} = \frac{\square}{\square}$

$\frac{\square}{\square} \times 4 = \frac{\square}{\square}$

$\frac{\square}{\square} = \square\frac{\square}{\square}$

The boat travels $\square\frac{\square}{\square}$ km.

3 **a)** Complete the multiplications.

$\frac{1}{4} \times 2 = \frac{2}{4}$ $\quad\quad$ $\frac{1}{6} \times 5 = \frac{5}{6}$

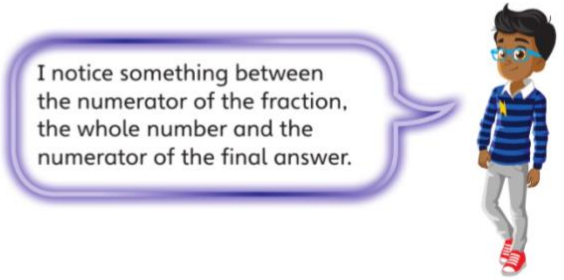
$\frac{1}{4} \times 3 = \frac{3}{4}$ $\quad\quad$ $\frac{2}{6} \times 5 = \frac{\square}{\square}$

$\frac{1}{4} \times 5 = \frac{\square}{\square}$ $\quad\quad$ $\frac{5}{6} \times 5 = \frac{\square}{\square}$

$\frac{1}{4} \times 9 = \frac{\square}{\square}$ $\quad\quad$ $1\frac{1}{6} \times 5 = \frac{\square}{\square}$

What patterns do you notice?

Can you find a quick way to get the answers?



b) Find three fractions that multiply by a whole number to make these numbers.

$\frac{5}{8}$ $\quad\quad$ $\frac{10}{9}$ $\quad\quad$ $1\frac{1}{5}$

→ Practice book 6A p126

Tuesday 24th

Multiplying a fraction by a fraction 1

Discover

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.

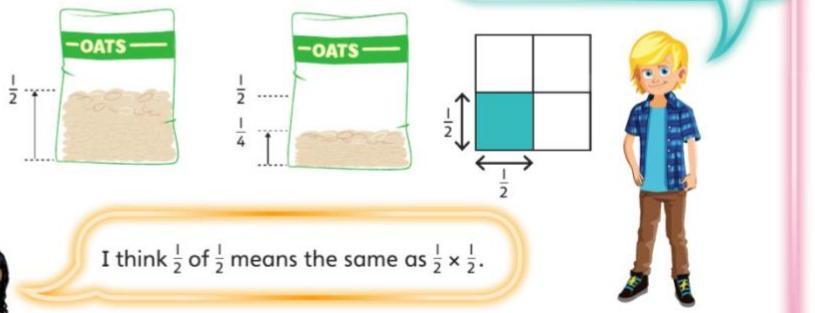
They need $\frac{1}{2}$ of this to make the flapjack.

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.

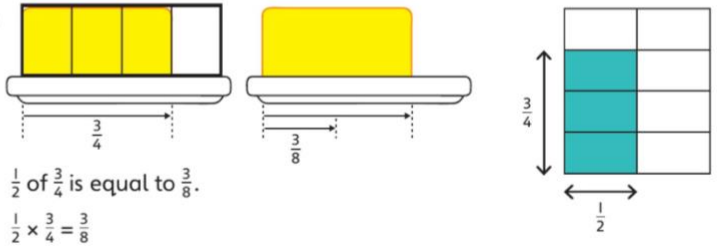


$\frac{1}{2}$ of $\frac{1}{2}$ is equal to $\frac{1}{4}$.

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 $\frac{3}{8}$.

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

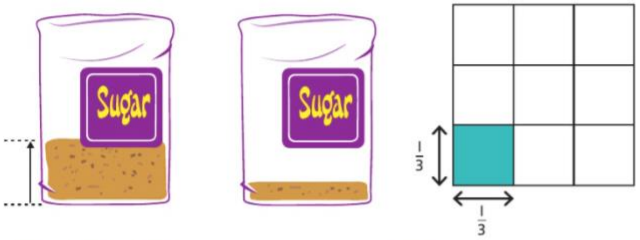
Bella and Amal need to use $\frac{3}{8}$ of a block of butter.

Think together

1 Bella is now making brownies.

The bag of sugar is $\frac{1}{3}$ full. Bella uses $\frac{1}{3}$ of the sugar in the bag.

What fraction of the bag will she use?



$\square/\square \times \square/\square = \square/\square$

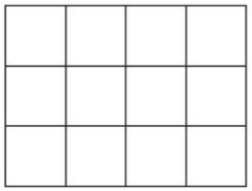
Bella will use $\square/\square$ of the bag of sugar.

2 The brownies take $\frac{2}{3}$ of an hour to cook.

Amal is going to check on them when they have been cooking for $\frac{3}{4}$ of the time needed.

What fraction of the hour will have passed when Amal checks on the brownies?

$\square/\square \times \square/\square = \square/\square$

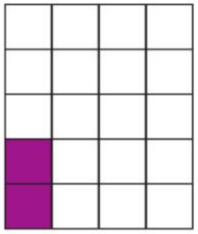


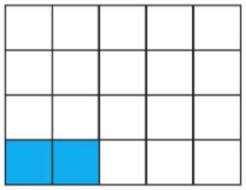
$\square/\square$ of the hour will have passed.

3 **a)** Amelia and Richard are working out $\frac{1}{4} \times \frac{2}{5}$.

Amelia

Richard





Which diagram is correct? Explain why.

Remember, you could also write this multiplication as $\frac{1}{4}$ of $\frac{2}{5}$.

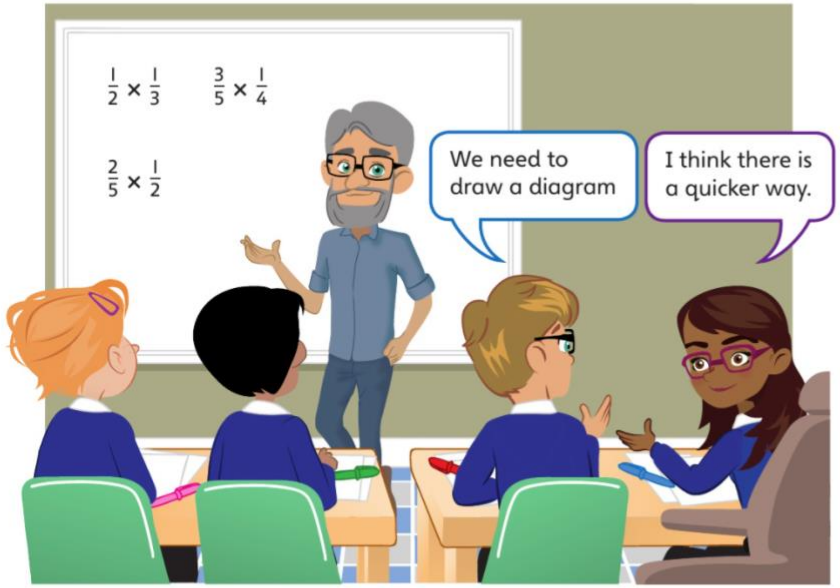
b) Use diagrams to work out these calculations.

$\frac{1}{3} \times \frac{3}{4}$ $\frac{2}{5}$ of $\frac{1}{4}$

Wednesday 25th

Multiplying a fraction by a fraction 2

Discover



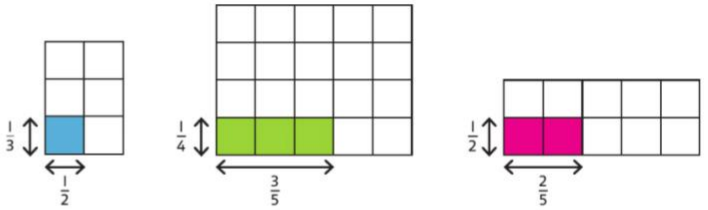
1 **a)** Use diagrams to find the answers to the calculations.

b) Look at your answers.

How can you work out the answers without diagrams?

Share

a)



The total number of blocks gives the denominator of the answer.

The number of shaded blocks gives the numerator of the answer.

$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$ $\frac{3}{5} \times \frac{1}{4} = \frac{3}{20}$ $\frac{2}{5} \times \frac{1}{2} = \frac{2}{10}$

I noticed that I multiply the numerators together and the denominators together.

b) $\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$

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

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

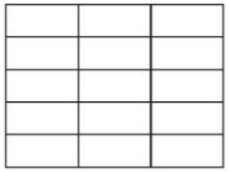
So $\frac{2}{5} \times \frac{1}{2} = \frac{1}{5}$.

I think I can simplify the last answer by dividing both the numerator and the denominator by 2.

Think together

1 **a)** Use a diagram to work out $\frac{2}{3} \times \frac{4}{5}$.

$\frac{2}{3} \times \frac{4}{5} = \frac{\square}{\square}$



b) Now find the answer by multiplying the numerators and the denominators.

$\frac{2}{3} \times \frac{4}{5} = \frac{\square \times \square}{\square \times \square} = \frac{\square}{\square}$

Check your answer is the same.

2 Work out these calculations. Give each answer in its simplest form.

a) $\frac{3}{7} \times \frac{5}{6} = \frac{\square \times \square}{\square \times \square} = \frac{\square}{\square} = \frac{\square}{\square}$

b) $\frac{9}{10} \times \frac{2}{17} = \frac{\square \times \square}{\square \times \square} = \frac{\square}{\square} = \frac{\square}{\square}$

c) $\frac{2}{3} \times \frac{1}{4} \times \frac{1}{2} = \frac{\square}{\square}$

Why would drawing a diagram not be efficient for part b)?

3 **a)** Two fractions have been multiplied together.

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{5}{9}$

What could the fractions be?

How many different answers can you find?

b) Two more fractions have been multiplied together.

$\frac{\square}{\square} \times \frac{\square}{\square} = \frac{1}{6}$

One of the fractions is $\frac{2}{3}$.

What is the other fraction?

Is there more than one answer?

Thursday 26th

Dividing a fraction by a whole number 1

Discover

Make a pop-up card

Instructions

For the penguin's body

- Divide a circle into thirds.
- Divide one of the thirds into 2 equal parts.
- Leave one of these 2 parts white and put it at the top. Colour the rest of the circle black.

For the spring

- Fold a paper strip into quarters.
- Divide one of the quarters at the end of the strip into 2.
- Put glue on one of these 2 parts at the end of the strip.

1 a) What fraction of the penguin's body is white?

b) What fraction of the strip of paper is covered in glue?

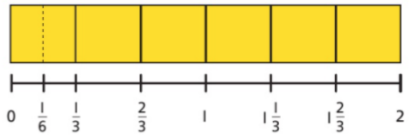
Share

a) The circle is divided into thirds.

One of the thirds is divided into 2 equal parts.

There are 6 of these equal parts in the circle.

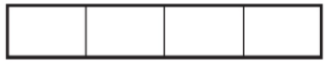
$\frac{1}{3} \div 2 = \frac{1}{6}$



I divide $\frac{1}{3}$ into 2. This is the same as dividing $\frac{1}{3}$ by 2. When I divide $\frac{1}{3}$ by 2, I can see that I have $\frac{1}{6}$.

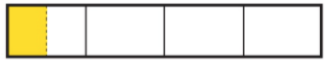
$\frac{1}{6}$ of the penguin's body is white.

b) The strip of paper is folded into quarters.



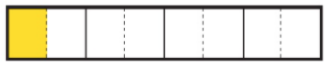
One of the quarters is divided into 2.

There are 8 equal parts this size.



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

$\frac{1}{8}$ of the strip of paper is covered in glue.



Think together

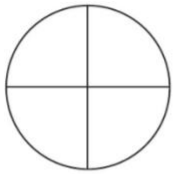
1 Divide a circle into quarters.

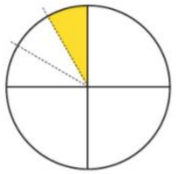
Divide 1 of the quarters into 3 parts. Shade in 1 of these parts.

What fraction of the circle is shaded?

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

$\frac{\square}{\square}$ of the circle is shaded.





2 Fold a strip of paper into thirds.

Divide 1 of the thirds into 3 parts. Shade in 1 of these parts.

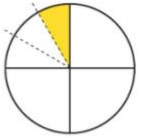
What fraction of the paper is shaded?

$\frac{\square}{\square} \div \square = \frac{\square}{\square}$

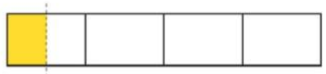
$\frac{\square}{\square}$ of the paper is shaded.

3 **a)** Here are the calculations you have done so far.

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



$\frac{1}{4} \div 3 = \frac{1}{12}$



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

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

What is the same about each calculation?

What is different?

b) What do you notice about the answers?

Is there a way you can find the answer without drawing the diagram?

Use your method to work out these divisions.

$\frac{1}{6} \div 2 = \frac{\square}{\square}$ $\frac{1}{4} \div 4 = \frac{\square}{\square}$ $\frac{1}{5} \div 3 = \frac{\square}{\square}$

Check your answers using diagrams.

Friday 27th

Dividing a fraction by a whole number 2

Discover

1 **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?

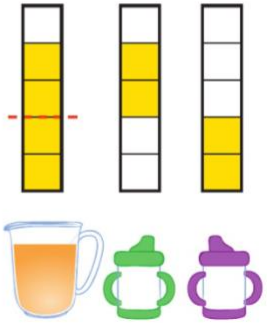
b) $\frac{9}{10}$ of the jar of baby food will be enough for 3 equal meals.

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.

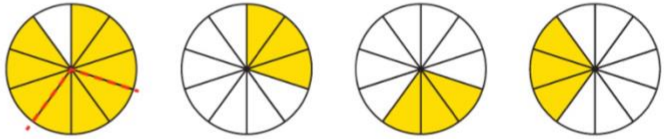
I drew a diagram to represent the juice in the jug and then I divided this by 2. I can write this as a division.



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

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

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



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

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

Think together

1 A packet of rusks is $\frac{6}{7}$ full.

Draw a diagram to show how the biscuits can be shared equally between the 3 babies.

Write this as a division calculation.

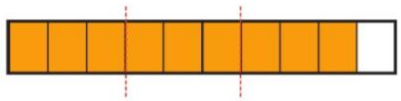
$\frac{6}{7} \div 3 = \frac{\square}{\square}$

What fraction of the packet does each baby get?

Each baby gets $\frac{\square}{\square}$ of the packet.

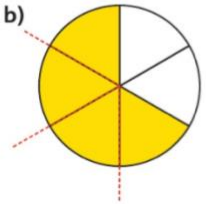
2 What division calculations are shown?

a)



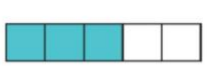
$\frac{\square}{\square} \div \square = \frac{\square}{\square}$

b)



$\frac{\square}{\square} \div \square = \frac{\square}{\square}$

3 **a)** Use the diagrams to complete these calculations.



$\frac{3}{5} \div 3 = \frac{\square}{\square}$

$\frac{\square}{\square} \div 4 = \frac{\square}{\square}$

$\frac{\square}{\square} \div 5 = \frac{\square}{\square}$

$\frac{\square}{\square} \div 5 = \frac{\square}{\square}$

Is there a way you can find each answer without drawing a diagram?

b) Work out the missing fractions without using a diagram.

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

$\frac{12}{25} \div 3 = \frac{\square}{\square}$

$\frac{8}{9} \div 2 = \frac{\square}{\square}$

$\frac{\square}{\square} \div 4 = \frac{2}{9}$