

MARLBOROUGH ROAD ACADEMY

MATHEMATICS CALCULATION POLICY

This Calculation Policy supports the Maths No Problem Singapore Maths scheme that is used in Y1-6 and the EYFS White Rose scheme of work.

Progression within in each area of calculation is in line with the programme of study in the 2014 National Curriculum. This calculation policy should be used to support children to develop a deep understanding of number and calculation.

This policy has been designed to teach children using concrete, pictorial and abstract methods/representations. C-P-A.

Concrete representation - a pupil is first introduced to an idea or a skill by acting it out with real objects. This is a 'hands on' component using real objects and it is the foundation for conceptual understanding.

Pictorial representation - a pupil has sufficiently understood the hands-on experiences performed and can now relate them to representations, such as a diagram or picture of the problem.

Abstract representation - a pupil is now capable of representing problems by using mathematical notation, for example: $12 \div 2 = 6$. It is important that conceptual understanding, supported using representation, is secure for all procedures. Reinforcement is achieved by going back and forth between these representations.

Document Status

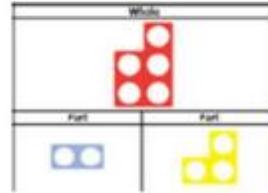
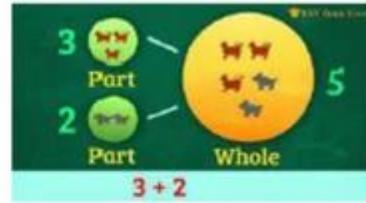
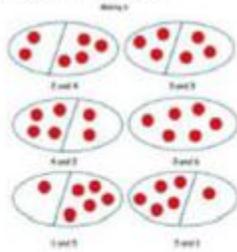
Version	Date	Action
1	October 2019	First Written
2		
3		
4		

This Policy has been impact assessed to ensure that it does not have an adverse effect on race, gender or disability equality

Addition

Explore part- part –whole relationship: combining 2 parts to make a whole.

The different ways of showing addition using pictures



Using the ten frame to support the addition of 2 numbers: combining two groups.

	$6 + 4 = 10$
	$4 + 4 = 8$
	$5 + 2 = 7$
	$2 + 4 = 6$

Recognise different ways of making numbers.



Solving problems using concrete and pictorial images.

Sara has 2 apples.
Jon has 5 apples.
How many apples do they have altogether?
How many more apples does Jon have than Sara?



Subtraction

Using concrete strategies for counting.

Taking away after counting out practical equipment. Children would be encouraged to physically remove these using touch counting.



By touch counting and dragging in this way, it allows children to keep track of how many they are removing so they don't have to keep recounting. They will then touch count the amount that are left to find the answer.

Those who are ready may record their own calculations

Using the ten frame to support subtraction by taking away.

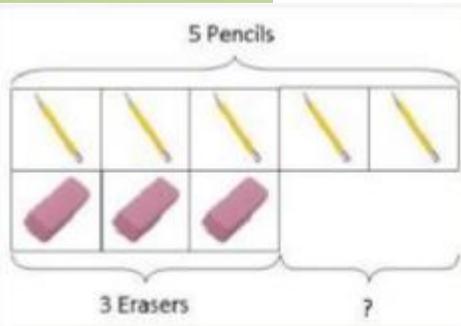


$$8 - 4 = \underline{\quad}$$



Solving problems using concrete and pictorial images.

Peter has 5 pencils and 3 erasers. How many more pencils than erasers does he have?



Multiplication

Identifying and making equal objects of groups.

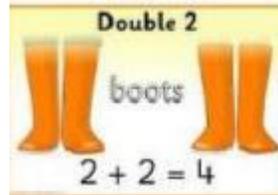
Children will experience equal groups of objects.

They will work on practical problem solving activities involving



There are 6 pairs of socks. How many socks are there altogether?

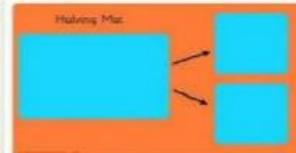
Using doubling when solving concrete and pictorial problems.



Division

Sharing objects into equal groups practically and pictorially.

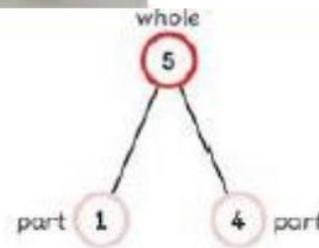
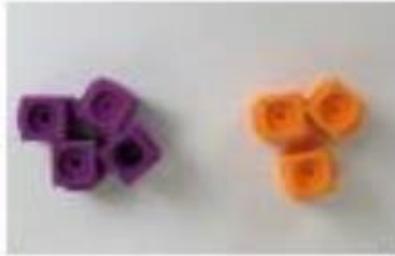
Hearing and being exposed to the language of sharing and halving. Practically exploring halving and seeing pictorial representations.



Addition

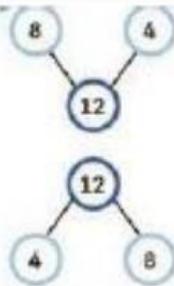
Combining two parts to make a whole: part-part-whole model. Joining two groups and recounting all of the objects. With a focus on finding and learning number bonds for all numbers to 10- number bond cards are to be used to develop recall alongside the Numbots app.

$$3 + 4 = 7$$



<p> $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ </p> <p>Tens Frame</p>	<p> $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ </p> <p>Part Whole Model</p>	<table border="1"> <tr><td colspan="2">10</td></tr> <tr><td>6</td><td>4</td></tr> </table> <p> $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ </p> <p>Bar Model</p>	10		6	4
10						
6	4					

Learn number bonds to 20 and demonstrate an understanding of related facts.



$$8 + 4 = 12$$

$$4 + 8 = 12$$

This is a family of addition and subtraction facts.

$$12 - 8 = 4$$

$$12 - 4 = 8$$



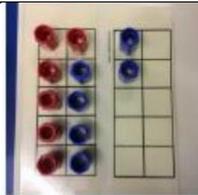
Add and subtract one digit numbers to and from 2 digit numbers to 20, including zero.



$$8 + 1 = 9$$

Bridging ten using ten frames, bar models, and number lines.

Children should start with the largest number and see how many more needed to make ten.



$$6 + 6 = 12$$



Make 9 in one and 3 in the other. Take one from the 3 to make the 9 into a ten... $10 + 2 = 12$

Subtraction

Subtraction as taking away practically using cubes, objects, Dienes etc.



$$6 - 3 = 3$$

Subtract by crossing out

Subtract by Crossing Out



$$7 - 2 = 5$$

5 ladybirds are left.

Subtract using the part-part-whole model (including missing number problems)



$$7 - 5 = 2$$

2 boats are not red.

Subtraction by counting back.

Subtract 1 digit number from a 2 digit number by subtracting from 10.

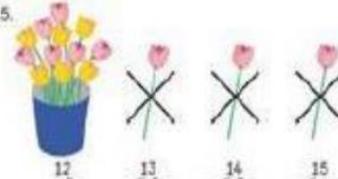
Subtract a one digit number from a 2 digit number by renaming / regrouping ten as ten ones, using Deines.

Let's Learn

Subtract by Counting Back

Count back 3 steps from 15.

Subtract 3 from 15.



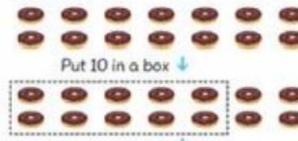
$$15 - 3 = 12$$

There are 12 flowers left.

Let's Learn

Subtract from 10

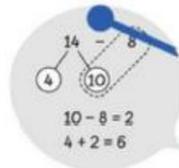
$$14 - 8 = ?$$



Put 10 in a box

$$14 - 8 = 6$$

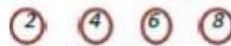
Sam has 6 doughnuts left.



$$20 - 4 = 16$$

Multiplication

Count in multiples of 2, 5, and 10 from zero.



4 groups of 2 = 8

$$4 \times 2 = 8$$



$$2 \times 4 = 8$$



2

two

2

two

2

two

2

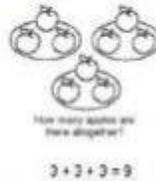
two

Emphasis the vocabulary in pictorial and written calculations.

Solve multiplication problems using repeated addition.



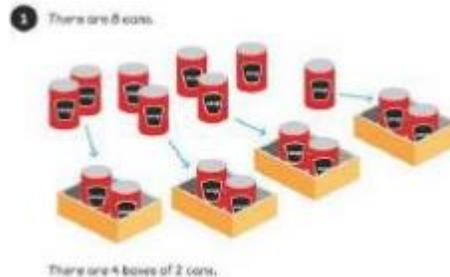
This image represents two groups of 4 or 4 twice



Division

Pupils should be taught to share practically, and the sharing should be shown beneath the whole, as shown in the image.

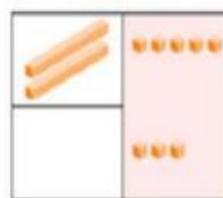
$$10 \div 2 = 5$$



Year 2

Addition

Use concrete objects and pictorial representations to add a 1 digit number to a 2 digit number.

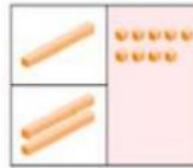


tens	ones
2	5
+	3
<hr/>	
	8

Use concrete and pictorial representations to add a multiple of 10 to a 2 digit number.

Use concrete and pictorial representations to add two 2 digit numbers.

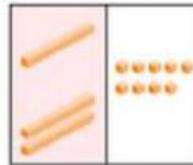
Step 1 Add the ones.



tens	ones
1	9
+ 2	0
<hr/>	
	9

Step 2 Add the tens.

1 ten + 2 tens = 3 tens

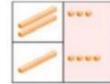


tens	ones
1	9
+ 2	0
<hr/>	
3	9

$19 + 20 = 39$

Step 1 Add the ones.

3 ones + 4 ones = 7 ones



tens	ones
2	3
+ 1	4
<hr/>	
	7

Step 2 Add the tens.

2 tens + 1 ten = 3 tens



tens	ones
2	3
+ 1	4
<hr/>	
3	7

$23 + 14 = 37$

Adding with renaming

Add 15 and 18.

Use to help you add.

Step 1 Add the ones.
5 ones + 8 ones = 13 ones
Regroup the ones.
13 ones = 1 ten and 3 ones



tens	ones
1	5
+ 1	8
<hr/>	
1	3

Step 2 Add the tens.

1 ten + 1 ten + 1 ten = 3 tens



tens	ones
1	5
+ 1	8
<hr/>	
1	3
+ 2	0
<hr/>	
3	3

$15 + 18 = 33$

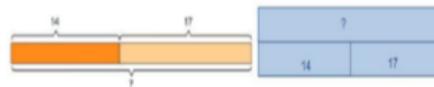
Use concrete objects and pictorial objects to add 3 1 digit numbers.

$7 + 3 + 2 =$ leads to $10 + 2 =$



Use bar models to find missing numbers.

Helen has 14 breadsticks. Her friend has 17. How many do they have altogether?



Subtraction

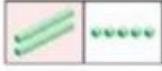
Use concrete objects and pictorial representations to subtract a 1 digit number from a 2 digit number.

Step 1 Subtract the ones.
6 ones - 3 ones = 3 ones



tens	ones
2	6
-	3
2	3

Step 2 Subtract the tens.
2 tens - 2 tens = 0 tens



tens	ones
2	3
-	2
0	3

$26 - 3 = 23$

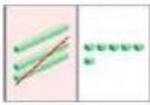
Use concrete and pictorial representations to subtract a multiple of 10 from a 2 digit number.

Step 1 Subtract the ones.
6 ones - 0 ones = 6 ones



tens	ones
3	6
-	0
3	6

Step 2 Subtract the tens.
3 tens - 2 tens = 1 ten



tens	ones
3	6
-	2
1	6

$36 - 20 = 16$

Use concrete and pictorial representations to subtract 2 digit number from a 2 digit number.

Subtract 24 from 37.

Step 1 Subtract the ones.
7 ones - 4 ones = 3 ones



tens	ones
3	7
-	4
3	3

Step 2 Subtract the tens.
3 tens - 2 tens = 1 ten



tens	ones
3	3
-	2
1	3

$37 - 24 = 13$

Use  to help you subtract.



Recognise and use the inverse relationship between addition and subtraction.

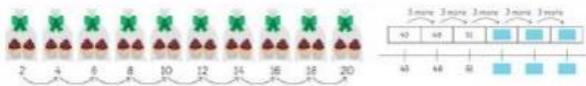
?	
23	53

76	
23	?

Use this to check calculations and solve missing number problems.

Multiplication

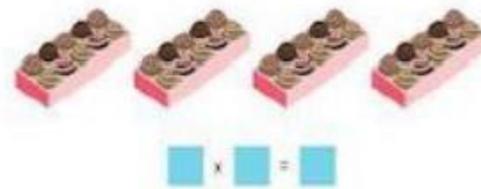
Skip count in multiples of 2, 3, 5 and 10 from 0.



Recall and use multiplication facts for the multiplication tables 2, 5 and 10.

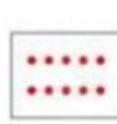
	$1 \times 10 = 10$
	$2 \times 10 = 20$
	$3 \times 10 = 30$
	$4 \times 10 = 40$
	$5 \times 10 = 50$
	$6 \times 10 = 60$
	$7 \times 10 = 70$
	$8 \times 10 = 80$
	$9 \times 10 = 90$
	$10 \times 10 = 100$

Use the multiplication (x) and equals (=) sign when writing out multiplication calculations.



Understand that multiplication is commutative. Pupils should understand that an array can represent different equations, and that as multiplication is commutative, the order of the multiplication does not affect the answer.

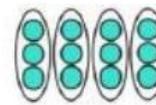
How many dots are there?



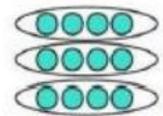
$2 \times 5 = 10$



$5 \times 2 = 10$



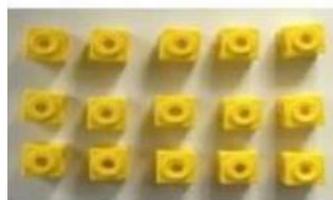
$12 = 3 \times 4$



$12 = 4 \times 3$

2×5 is equal to 5×2 .

Solve multiplication problems in context using arrays and repeated addition.



$3 \times 5 = \square$

$5 \times 3 = \square$



$3 + 3 + 3$



$2 + 2 + 2 + 2 + 2$

$3 \times 3 = 9$

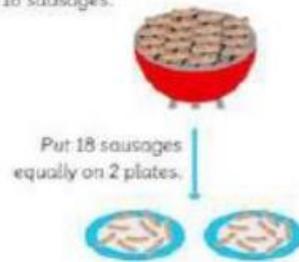
Division

Recall and use division facts for the 2, 5 and 10 times tables.

$10 \div 10 =$	•		•	<input type="text"/>
$20 \div 10 =$	•		•	<input type="text"/>
$30 \div 10 =$	•		•	<input type="text"/>
$50 \div 10 =$	•		•	<input type="text"/>
$60 \div 10 =$	•		•	<input type="text"/>
$100 \div 10 =$	•		•	<input type="text"/>

Solve division facts in context, using concrete objects, by sharing.

There are 18 sausages.



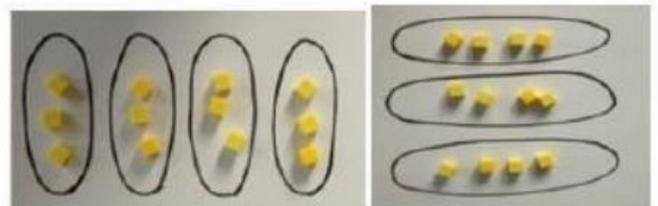
$$2 \times 9 = 18$$



There are 9 sausages on each plate.

$$18 \div 2 = 9$$

Solve division problems, in context, using arrays.



Put 10 buns in groups of 2.
How many plates are there?

Solve division problems, in context, by grouping.



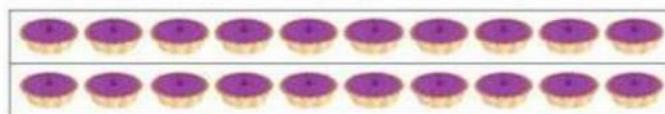
Understand and use the inverse - this should be taught alongside both multiplication and division.



Put into groups of 5.

There are groups.

Make a family of multiplication and division facts.



$2 \times 10 = 20$ ————— $20 \div 10 =$

$10 \times 2 = 20$ ————— $20 \div 2 =$

Year 3

Addition

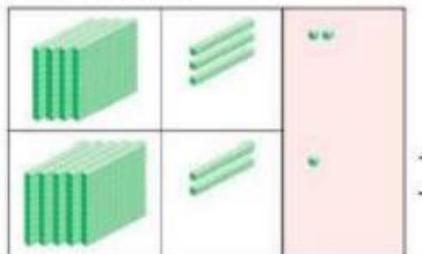
Add two three-digit numbers.

Children need to move from concrete, to pictorial, to abstract. Start without renaming and move to with renaming.

$432 + 521 =$

Step 1 Add the ones.

2 ones + 1 one = 3 ones

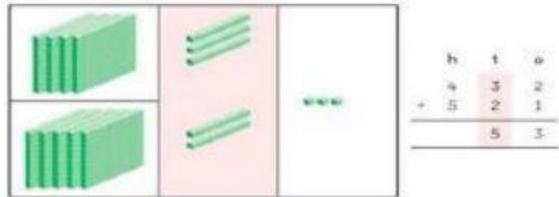


	h	t	o
	4	3	2
+	5	2	1
	3		

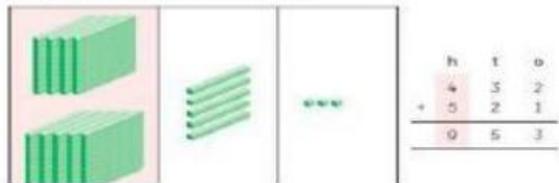
Solve problems using bar modelling.

Add fractions with the same denominator within one whole

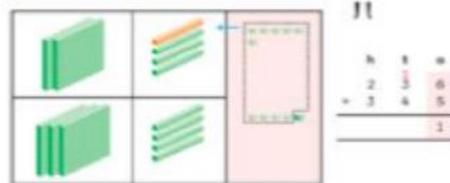
Step 2 Add the tens.
3 tens + 2 tens = 5 tens



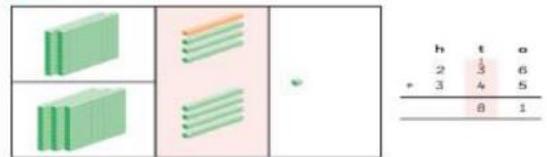
Step 3 Add the hundreds.
4 hundreds + 5 hundreds = 9 hundreds



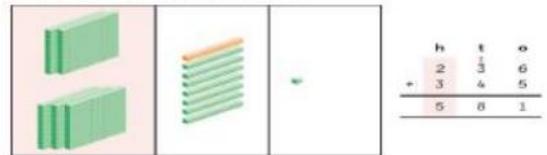
$$236 + 345 =$$



Step 2 Add the tens.
1 ten + 3 tens + 4 tens = 8 tens

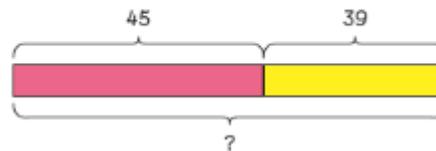


Step 3 Add the hundreds.
2 hundreds + 3 hundreds = 5 hundreds

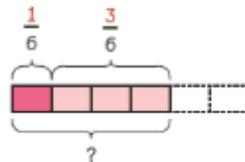


$$236 + 345 = 581$$

- 1 Sam had 45 stamps.
His father gave him 39 stamps.
How many stamps did Sam have?



Add $\frac{1}{6}$ and $\frac{3}{6}$.



1 sixth + 3 sixths = 4 sixths



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

Add $\frac{1}{7}$ and $\frac{3}{7}$.

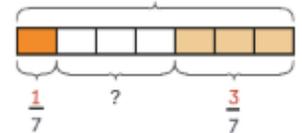


1 seventh + 3 sevenths = 4 sevenths



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

1 = 7 sevenths



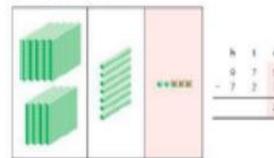
$$\frac{1}{7} + \frac{3}{7} + \frac{3}{7} = 1$$

Subtraction

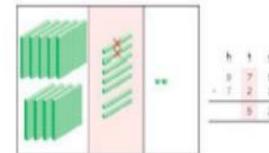
Subtract numbers up to three digits from a 3-digit number. It is very important that children use Dienes alongside a place value chart to support understanding. Only when secure with this, should exchanging be introduced.

Subtract 723 from 975.

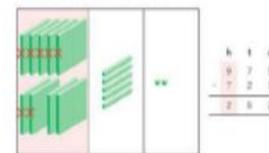
Step 1 Subtract the ones.
5 ones - 3 ones = 2 ones



Step 2 Subtract the tens.
7 tens - 2 tens = 5 tens



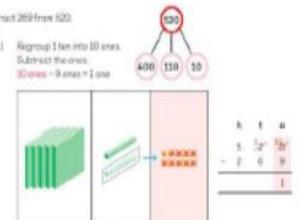
Step 3 Subtract the hundreds.
9 hundreds - 7 hundreds = 2 hundreds



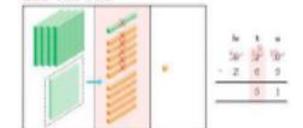
975 - 723 = 252

Subtract 269 from 500.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
10 ones - 9 ones = 1 one



Step 2 Regroup 1 ten into 10 ones.
Subtract the tens.
10 ones - 6 ones = 4 ones



Step 3 Subtract the hundreds.
4 hundreds - 2 hundreds = 2 hundreds



500 - 269 = 231

Use the bar model to visualise finding missing numbers.

315		$315 - 185 = ?$
185	?	$185 + ? = 315$

?		$185 + 315 = ?$
185	315	$? - 185 = 315$

Use bar models to help to solve problems.

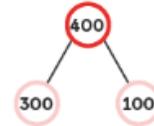
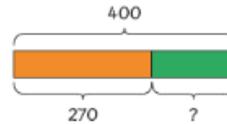
In Focus

Hannah baked 400 tarts.
She gave 270 tarts away.
How many tarts did Hannah have left?



Let's Learn

Subtract 270 from 400.



h	t	o
3	4	0
-	2	7
<hr/>		
1	3	0

$$400 - 270 = \square$$

$$300 - 200 = \square$$

$$100 - 70 = \square$$

Hannah had 130 tarts left.

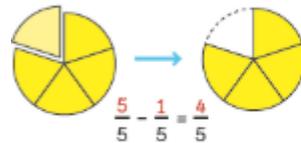


Subtract fractions with the same denominator within one whole.

The pizza was cut into 5 equal slices.

Sam ate $\frac{1}{5}$ of the pizza.

Subtract $\frac{1}{5}$ from $\frac{5}{5}$.



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

$\frac{4}{5}$ of the pizza was left.

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

$$5 \text{ fifths} - 1 \text{ fifth} = 4 \text{ fifths}$$



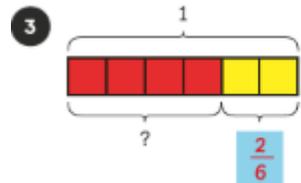
Subtract $\frac{1}{3}$ from 1.



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

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

$$3 \text{ thirds} - 1 \text{ third} = 2 \text{ thirds}$$



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

Multiplication

Children to recall the following times tables:
2, 5, 10, 3, 4, 8.

$3 \times 4 = \square$

$3 \times 8 = \square$

$5 \times 4 = \square$

$5 \times 8 = \square$

$2 \times 8 = \square$

$3 \times 8 = \square$

$2 \times 8 = \square$

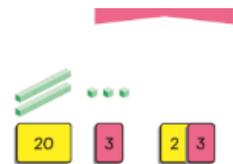
$5 \times 8 = \square$

$7 \times 8 = \square$

Multiply a 2 digit number by a one digit number.

In Focus

There are 23 children in a class.
How many children are there in 2 classes?



Let's Learn



Step 1 Multiply the ones by 2.
 $3 \text{ ones} \times 2 = 6 \text{ ones}$

Step 2 Multiply the tens by 2.
 $2 \text{ tens} \times 2 = 4 \text{ tens}$

Step 3 Add the products.
 $6 + 40 = 46$

$23 \times 2 = 46$

There are 46 children in the 2 classes.

	t	o
	2	3
x		2
<hr/>		
		6

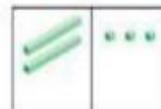
	t	o
	2	3
x		2
<hr/>		
		6
	4	0

	t	o
	2	3
x		2
<hr/>		
		6
	4	0
<hr/>		
	4	6

Multiply a 2-digit number by a two-digit number,
including regrouping.

Let's Learn

- 1 There are 4 groups of 23 fish.
How do we multiply 23 by 4?



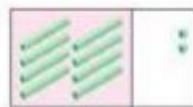
Step 1: Multiply the ones by 4.



4 ones \times 3 = 12 ones
12 ones = 1 ten 2 ones



t	o
2	3
+	4
1	2

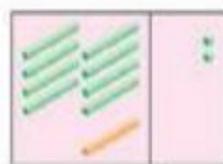


2 tens \times 4 = 8 tens

Step 2: Multiply the tens by 4.



t	o
2	3
+	4
8	0



12 + 80 = 92

Step 3: Add the products.



t	o
2	3
+	4
1	2
+	80
9	2

$23 \times 4 = 92$

There are 92 fish in 4 tanks.

In Focus

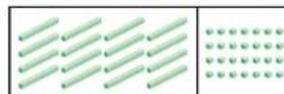
This is how Hannah did 47×4 .
Is she correct?

h	t	o
	2	7
x	4	4
1	8	8



Let's Learn

- 1 This is 47.



7 ones \times 4 = 28 ones
28 ones = 2 tens + 8 ones

Step 1: Multiply the ones by 4.



2 tens	t	o
	2	7
x	4	4
	8	8

4 tens \times 4 = 16 tens
16 tens + 2 tens = 18 tens

Step 2: Multiply the tens by 4.



h	t	o
	2	7
x	4	4
1	8	8

$47 \times 4 = 188$

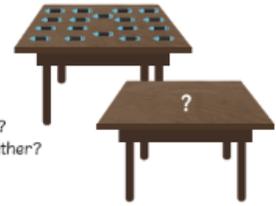
Hannah is correct.

Use the bar model to help to solve multiplication problems.

In Focus

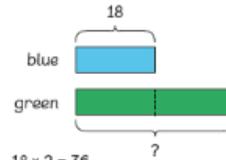
There are 18 blue crayons on the table.
There are twice as many green crayons
as blue crayons on another table.

- (a) How many green crayons are there?
- (b) How many crayons are there altogether?



Let's Learn

1 (a)

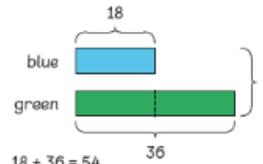


'Twice' means
2 times.



There are 36 green crayons.

(b)



There are 54 crayons altogether.

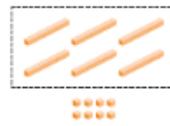
Division

Divide 2-digit numbers by one-digit numbers.

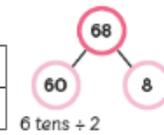
To find the number of sweets each person gets, divide 68 by 2.

$$68 \div 2 = \square$$

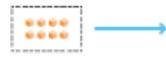
Step 1 Divide 6 tens by 2.



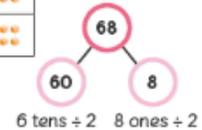
$$6 \text{ tens} \div 2 = 3 \text{ tens}$$



Step 2 Divide 8 ones by 2.



$$8 \text{ ones} \div 2 = 4 \text{ ones}$$



Step 3 Add the results.

$$68 \div 2 = 30 + 4 = 34$$

Each person gets 34 sweets.

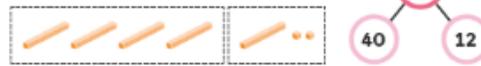
Divide by regrouping.

Let's Learn

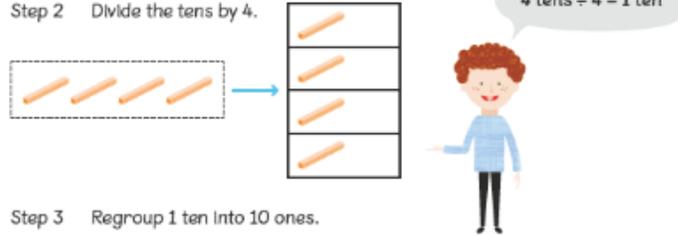
To find the number of ice creams in each box, divide 52 by 4.

$$52 \div 4 = \square$$

Step 1 Split 52 into 40 and 12.



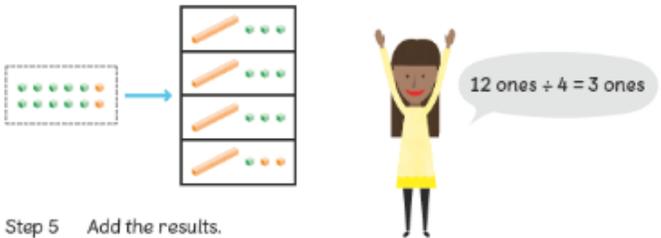
Step 2 Divide the tens by 4.



Step 3 Regroup 1 ten into 10 ones.



Step 4 Divide the ones by 4.

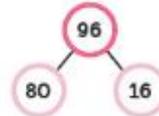


Step 5 Add the results.

$$52 \div 4 = 10 + 3 = 13$$

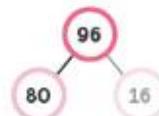
There are 13 ice creams in each box.

Let's Learn



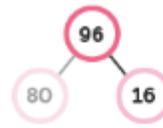
First, I take 80 from 96.
Then, I take 16 from the remaining 16.

$$\begin{array}{r} 12 \\ 8 \overline{) 96} \\ \underline{- 80} \\ 16 \\ \underline{- 16} \\ 0 \end{array}$$

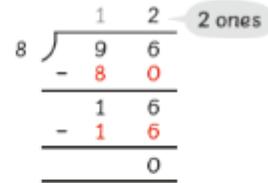


$$\begin{array}{r} 12 \\ 8 \overline{) 96} \\ \underline{- 80} \\ 16 \\ \underline{- 16} \\ 0 \end{array}$$

$$8 \text{ tens} \div 8 = 1 \text{ ten}$$

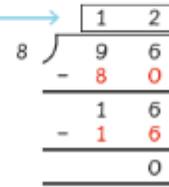


$$16 \text{ ones} \div 8 = 2 \text{ ones}$$



$$1 \text{ ten} + 2 \text{ ones} = 12$$

$$96 \div 8 = 12$$

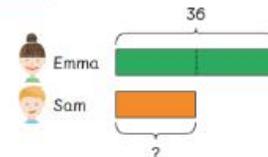


In Focus



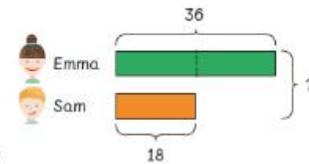
How many beads do the children have altogether?

Let's Learn



$$36 \div 2 = 18$$

Sam has 18 beads.



$$36 + 18 = 54$$

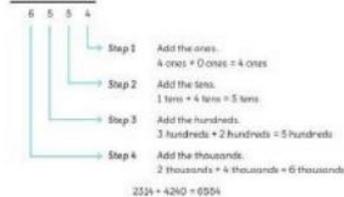
The children have 54 beads altogether.

Year 4

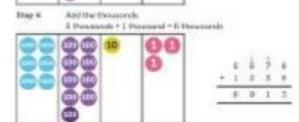
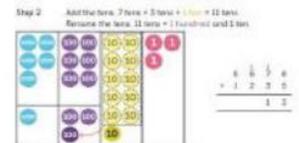
Addition

Adding numbers with up to 4 digits, including renaming.

$$\begin{array}{r} 2314 \\ + 4240 \\ \hline \end{array}$$



$$2314 + 4240 = 6554$$



In Focus

Charles uses digit cards to make two numbers.



Find their sum.

Let's Learn

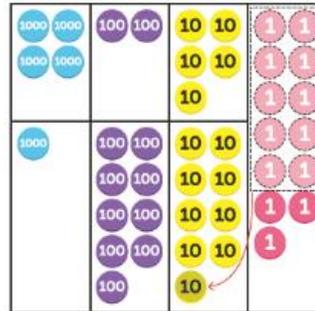
1 Estimate the sum of 4256 and 1987.

$$\begin{array}{r} 4000 \\ + 2000 \\ \hline 6000 \end{array}$$

4000 + 2000 = 6000

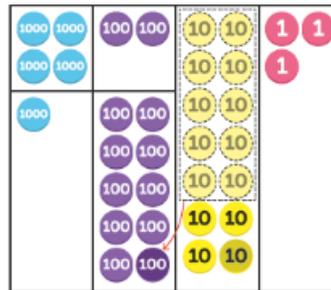
2 Find the sum of 4256 and 1987.

Step 1 Add the ones. 6 ones + 7 ones = 13 ones
Rename the ones. 13 ones = 1 ten and 3 ones



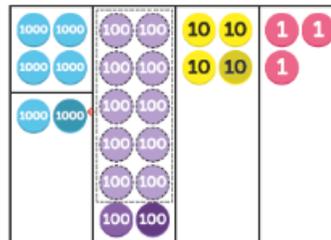
$$\begin{array}{r} 4256 \\ + 1987 \\ \hline 3 \end{array}$$

Step 2 Add the tens. 5 tens + 8 tens + 1 ten = 14 tens
Rename the tens. 14 tens = 1 hundred and 4 tens



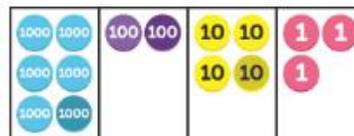
$$\begin{array}{r} 4256 \\ + 1987 \\ \hline 43 \end{array}$$

Step 3 Add the hundreds.
2 hundreds + 9 hundreds + 1 hundred = 12 hundreds
Rename the hundreds. 12 hundreds = 1 thousand and 2 hundreds



$$\begin{array}{r} 4256 \\ + 1987 \\ \hline 243 \end{array}$$

Step 4 Add the thousands.
4 thousands + 1 thousand + 1 thousand = 6 thousands



$$\begin{array}{r} 4256 \\ + 1987 \\ \hline 6243 \end{array}$$

Use the bar model to help to solve 2 step problems.

Add fractions with the same denominator

2 $£3.89 + £2.80 = £ 6.69$



Altogether they cost £6 and 69p or £6.69.

$169p = £1 \text{ and } 69p = £1.69$

In Focus

On Saturday, 3018 people attended a funfair. 850 more people attended the funfair on Saturday than attended it on Sunday.

Altogether, how many people attended the funfair over the two days?



Let's Learn

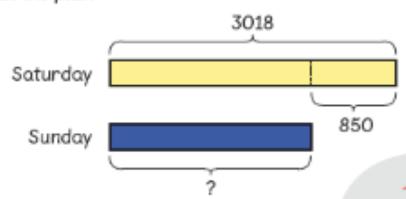
1 Understand the problem

Who?	 people
What?	funfair

Make a plan



Carry out the plan



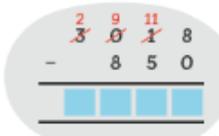
$3018 - 850 = 2168$

2168 people attended the funfair on Sunday.

Saturday	3	0	1	8	
Sunday	+	2	1	6	8
		5	1	8	6

$3018 + 2168 = 5186$

Altogether, 5186 people attended the funfair over the two days.

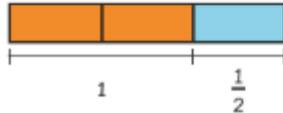




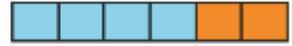
3 quarters + 3 quarters = 6 quarters

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

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



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



1

$\frac{2}{4}$



Subtraction

Subtract numbers with up to four digit, including renaming.

Use place value charts and counters to support, before moving to the abstract.

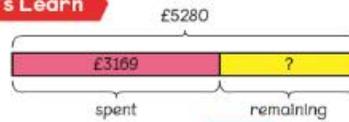
In Focus

After Ruby spent £3169, how much was left?

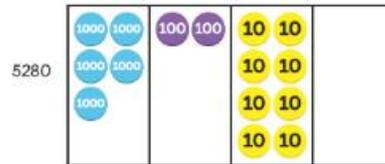
I have £5280 with me.



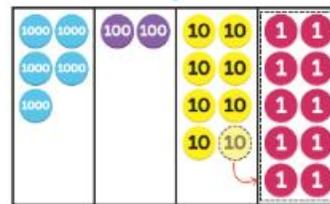
Let's Learn



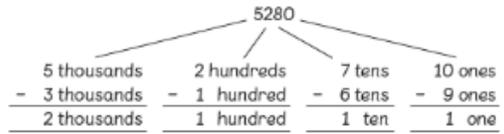
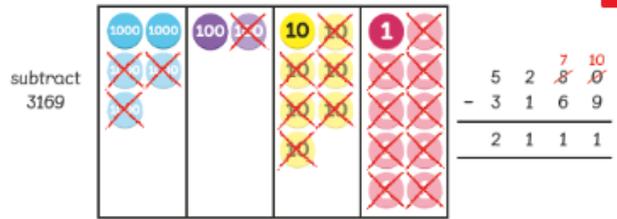
$$5280 - 3169 = \square$$



There aren't enough ones.



$$\begin{array}{r} 5280 \\ - 3169 \\ \hline \end{array}$$



5280 - 3169 = 2111

£2111 was left.



Use the bar model to help to solve 2 step problems.

In Focus

A baker made 2750 chocolate cookies and 1638 vanilla cookies.
He sold 3195 cookies altogether.
How many cookies did he have left?

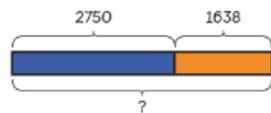


Let's Learn

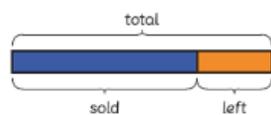
- 1 Understand the problem

Who?	baker
What?	cookies

Make a plan



Find the total number of cookies he made.



Then, subtract the number of cookies sold.



Subtract fractions with the same denominator.

Carry out the plan

$$2750 + 1638 = 4388$$

The baker baked 4388 cookies.

$$4388 - 3195 = 1193$$

He had 1193 cookies left.

Check

Cookies sold	3195
Cookies left	1193
Cookies baked	4388

$$\begin{array}{r} 1 \\ 2750 \\ + 1638 \\ \hline 4388 \end{array}$$

$$\begin{array}{r} 2 \quad 18 \\ 4388 \\ - 3195 \\ \hline 1193 \end{array}$$

$$\begin{array}{r} 3195 \\ + 1193 \\ \hline 4388 \end{array}$$



In Focus

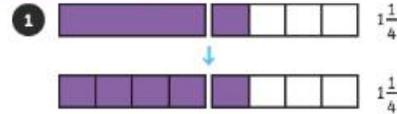


There is $1\frac{1}{4}$ kg of flour in the sack.



What is the mass of flour left in the sack after $\frac{3}{4}$ kg is removed?

Let's Learn



$$1\frac{1}{4} - \frac{3}{4} = \frac{5}{4} - \frac{3}{4} = \frac{2}{4}$$

$$1\frac{1}{4} - \frac{3}{4} = \frac{1}{2}$$

There is $\frac{1}{2}$ kg of flour left in the sack.

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



Multiplication

Children to know all times tables to 12 x 12.

1 $2 \times 12 = 24$

$3 \times 12 =$

12 **12** **12**

2 $2 \times 12 = 24$

$4 \times 12 =$

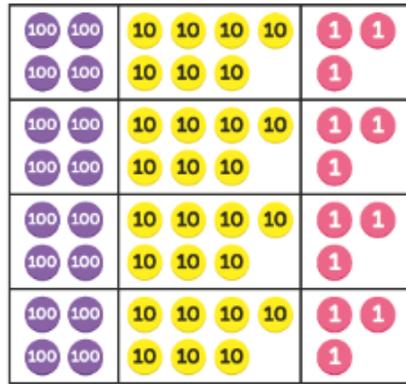
$6 \times 12 =$

12 **12** **12** **12** **12** **12**

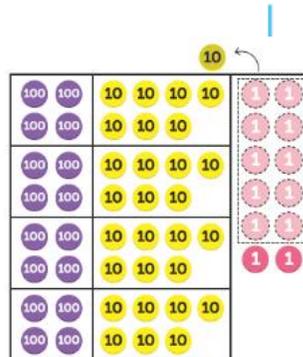
Multiply 2 and 3 digit numbers using a formal written method.

Use place value charts and counters to support, before moving to the abstract.

3 $473 \times 4 =$



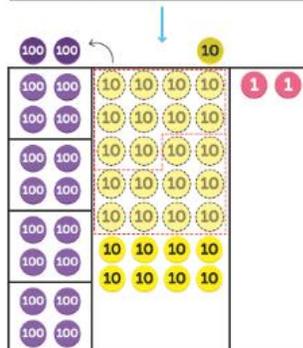
$$\begin{array}{r} 473 \\ \times 4 \\ \hline \end{array}$$



Multiply the ones.

$$\begin{array}{r} 473 \\ \times 4 \\ \hline 2 \end{array}$$

Don't forget to add the 1 ten.



Multiply the tens.

$$\begin{array}{r} 2473 \\ \times 4 \\ \hline 92 \end{array}$$

Don't forget to add the 2 hundreds.

Multiply the hundreds.

$$\begin{array}{r} 2473 \\ \times 4 \\ \hline 1892 \end{array}$$

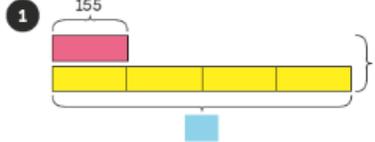
Solve problems involving multiplication using the bar model to help.

In Focus

Lulu has 155 beads.
Holly has 4 times as many beads as Lulu has.
How many beads do Lulu and Holly have altogether?



Let's Learn



Method 1

$$155 \times 4 = \square$$

Holly has \square beads.

$$\square + \square = \square$$

Lulu and Holly have \square beads altogether.

$$\begin{array}{r} 155 \\ \times 4 \\ \hline \end{array}$$

Method 2

$$\begin{aligned} 1 \text{ unit} &= 155 \\ 5 \text{ units} &= 155 \times 5 \\ &= \square \end{aligned}$$

Lulu and Holly have \square beads altogether.

$$\begin{array}{r} 155 \\ \times 5 \\ \hline \end{array}$$

Division

Divide 2 and 3 digit numbers by a one digit number, including remainders.

In Focus

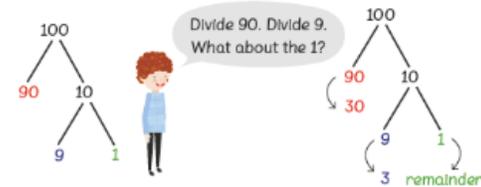
A shopkeeper repacks 100 kg of rice into 3-kg bags to sell.
How many bags does he get?



Let's Learn



Method 1



Method 2

$$\begin{array}{r} 3 \overline{) 100} \\ \underline{- 9} \\ 10 \\ \underline{- 9} \\ 1 \end{array}$$

$$\begin{array}{r} 033 \text{ remainder } 1 \\ 3 \overline{) 100} \\ \underline{- 9} \\ 10 \\ \underline{- 9} \\ 1 \end{array}$$

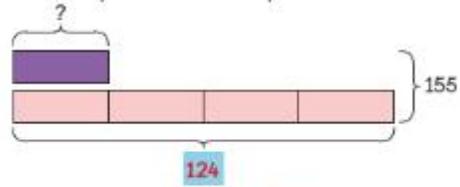
→ 3 tens
→ 3 ones
→ remainder

$$100 \div 3 = 33 \text{ remainder } 1$$

He gets 33 bags and a remainder of 1 kg of rice.

Solve word problems, using the bar model to help visualise the problem.

Holly has 4 times as many beads as Lulu has.
 Together they have 155 beads.
 How many beads does Holly have?



$$155 \div 5 = 31$$

Lulu has 31 beads.

$$31 \times 4 = 124$$

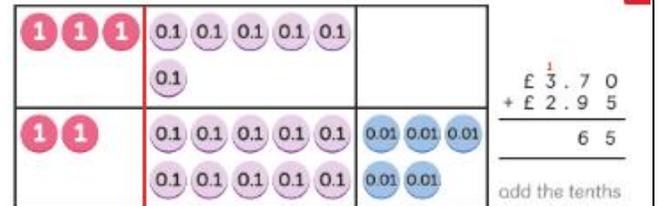
Holly has 124 beads.

Year 5

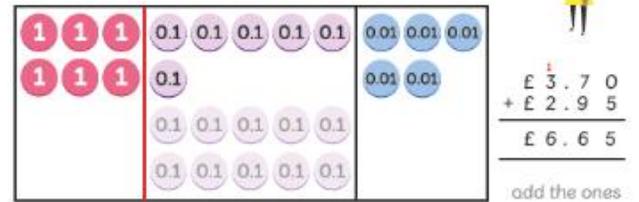
Addition

Adding numbers with more than 4 digits, using formal written methods, including those with decimals.

Use place value charts and counters to support, before moving to the abstract.



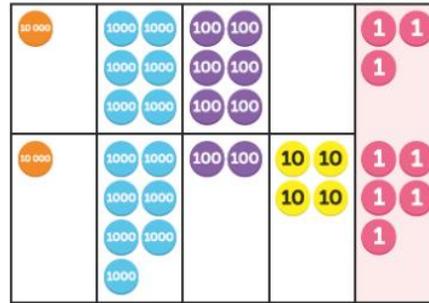
7 tenths + 9 tenths = 16 tenths
 16 tenths = 1 one 6 tenths



Together they cost £6.65.

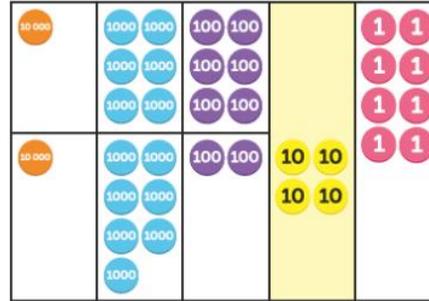
Add fractions with the same denominator and denominators that are multiples of the same number

Step 1 Add the ones.



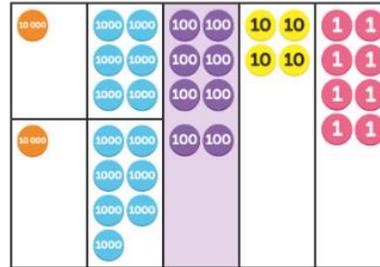
$$\begin{array}{r} 16\ 603 \\ + 17\ 245 \\ \hline 8 \end{array}$$

Step 2 Add the tens.



$$\begin{array}{r} 16\ 603 \\ + 17\ 245 \\ \hline 48 \end{array}$$

Step 3 Add the hundreds.



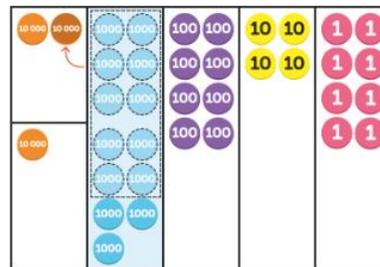
$$\begin{array}{r} 16\ 603 \\ + 17\ 245 \\ \hline 848 \end{array}$$

Step 4 Add the thousands.

6 thousands + 7 thousands = 13 thousands

Regroup the thousands.

13 thousands = 1 ten thousand and 3 thousands



$$\begin{array}{r} 1 \\ 16\ 603 \\ + 17\ 245 \\ \hline 3\ 848 \end{array}$$



Elliott's mother ordered 2 pizzas of the same size.



Elliott ate $\frac{1}{3}$ of one and $\frac{1}{6}$ of the other.

How much pizza did Elliott eat in all?

Let's Learn

1



$$\frac{1}{3}$$



$$\frac{1}{6}$$

We need to make the denominators equal before adding.



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



$$\frac{1}{6}$$

$$\begin{aligned} \frac{1}{3} + \frac{1}{6} &= \frac{2}{6} + \frac{1}{6} \\ &= \frac{3}{6} \\ &= \frac{1}{2} \end{aligned}$$

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



Elliott ate half a pizza in all.

2 Find the sum of $\frac{1}{6}$, $\frac{1}{2}$ and $\frac{1}{3}$.

Method 1

$$\begin{aligned}\frac{1}{6} + \frac{1}{2} + \frac{1}{3} &= \frac{1}{6} + \frac{3}{6} + \frac{2}{6} \\ &= \frac{6}{6} = 1\end{aligned}$$

Method 2

$$\begin{aligned}\frac{1}{6} + \frac{1}{2} + \frac{1}{3} &= \frac{1}{2} + \frac{1}{2} \\ &= 1\end{aligned}$$


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

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



The fractions have different denominators. We must make the denominators the same.

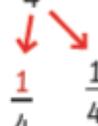
$$\begin{aligned}\frac{3}{4} + \frac{1}{2} \\ &= \frac{3}{4} + \frac{2}{4} \\ &= \frac{5}{4}\end{aligned}$$

$\frac{5}{4}$ is an improper fraction.

$$\begin{aligned}&= 1\frac{1}{4}\end{aligned}$$



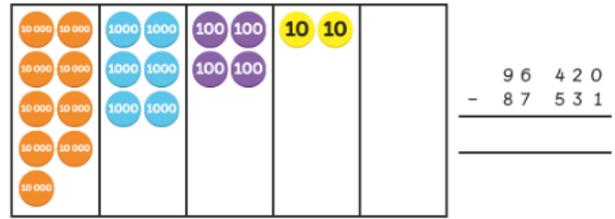
2 $\frac{3}{4} + \frac{1}{2} = \frac{3}{4} + \frac{2}{4}$


$$\begin{aligned}&= 1 + \frac{1}{4} \\ &= 1\frac{1}{4}\end{aligned}$$

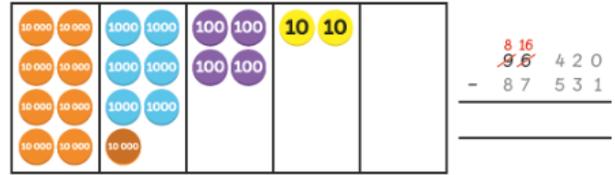
Subtraction

Subtract numbers with at least 4 digits using formal written methods, including decimal numbers.

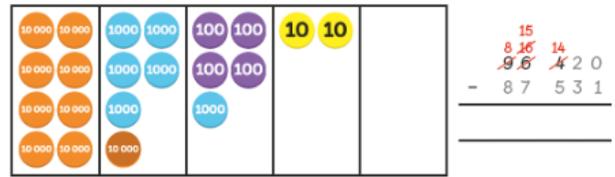
1 $96\,420 - 87\,531 = 8\,889$



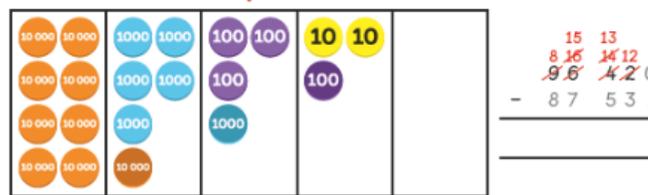
$$\begin{array}{r} 96\,420 \\ - 87\,531 \\ \hline \end{array}$$



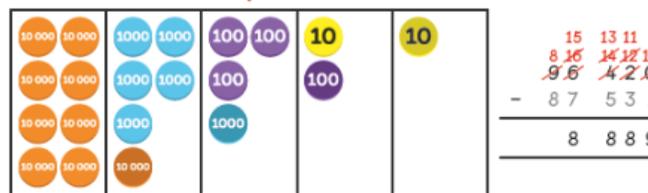
$$\begin{array}{r} 8\,16\,420 \\ - 87\,531 \\ \hline \end{array}$$



$$\begin{array}{r} 8\,15\,1420 \\ - 87\,531 \\ \hline \end{array}$$



$$\begin{array}{r} 8\,15\,13120 \\ - 87\,531 \\ \hline \end{array}$$

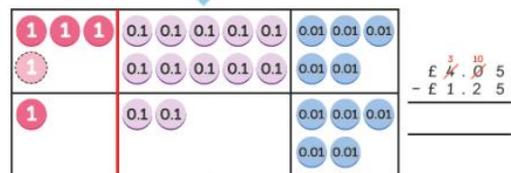


$$\begin{array}{r} 8\,15\,1311 \\ - 87\,531 \\ \hline 8\,889 \end{array}$$

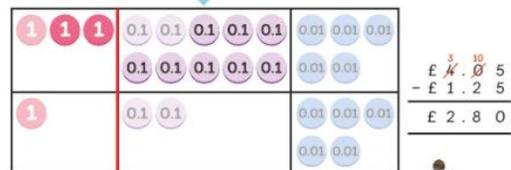
2 A boy picks £4.05 and a girl picks £1.25 and finds the difference.



$$\begin{array}{r} £\,4.05 \\ - £\,1.25 \\ \hline \end{array}$$



$$\begin{array}{r} £\,3.105 \\ - £\,1.25 \\ \hline \end{array}$$



$$\begin{array}{r} £\,3.105 \\ - £\,1.25 \\ \hline £\,2.80 \end{array}$$

The price difference is £2.80.

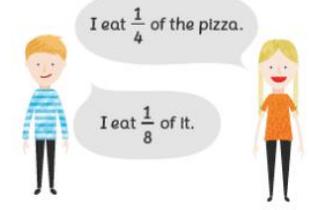


Subtract fractions with the same denominator and denominators that are multiples of the same number

In Focus



How much of the pizza is left over?



Let's Learn

1



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

$$\frac{3}{4} = \frac{6}{8}$$

We need equal denominators.



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



$\frac{5}{8}$ of the pizza is left over after and eat their share.

2

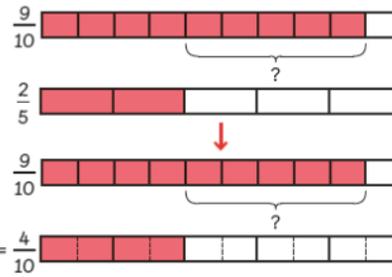
Subtract $\frac{3}{8}$ from 2.



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

2

$$\frac{9}{10} - \frac{2}{5} = \square$$

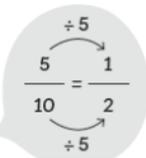


The difference between $\frac{9}{10}$ and $\frac{2}{5}$ is \square .



$$\frac{2}{5} = \frac{4}{10}$$

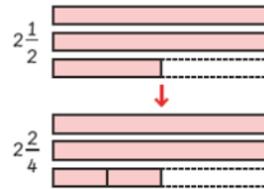
$$\begin{aligned} \frac{9}{10} - \frac{2}{5} \\ = \frac{9}{10} - \frac{4}{10} \\ = \frac{5}{10} = \frac{1}{2} \end{aligned}$$



1

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

Method 1



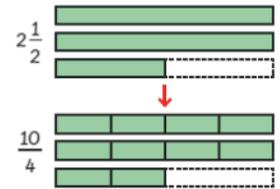
$$\begin{aligned} 2\frac{1}{2} - 1\frac{1}{4} \\ = 2\frac{2}{4} - 1\frac{1}{4} \\ = 1\frac{1}{4} \end{aligned}$$

2 - 1



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

Method 2



$$\begin{aligned} 2\frac{1}{2} - 1\frac{1}{4} \\ = \frac{10}{4} - \frac{5}{4} \\ = \frac{5}{4} \\ = 1\frac{1}{4} \end{aligned}$$

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



Multiplication

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

3 $1144 \times 8 =$ 1512

	1000	100	100	100	10	10	10
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1
1000	100	10	10	1	1	1	1

$12 \times 132 =$ 1584

$$\begin{array}{r}
 132 \\
 \times 12 \\
 \hline
 264 \quad \rightarrow \text{multiply by 2} \\
 + 1320 \quad \rightarrow \text{multiply by 10} \\
 \hline
 1584
 \end{array}$$

$$\begin{array}{r}
 123 \\
 \times 45 \\
 \hline
 615 \quad \rightarrow \text{multiply by 5} \\
 + 4920 \quad \rightarrow \text{multiply by 40} \\
 \hline
 5535
 \end{array}$$

$123 \times 45 = 5535$

Solve problems involving multiplication.



Is the offer a good deal?

I think it is! I will buy 3 sets of 8 boxes.



1 $8 \times \text{£}18 = 144$



10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

$8 \times 18 = 144$

$$\begin{array}{r} 18 \\ \times 8 \\ \hline 64 \\ + 80 \\ \hline 144 \end{array}$$
 multiply by ones
 multiply by tens

$8 \times 10 = 80$ $8 \times 8 = 64$

8 boxes would have cost £144.

They now cost £118.

What is the saving?



The distance between City A and City B is 1022 miles.

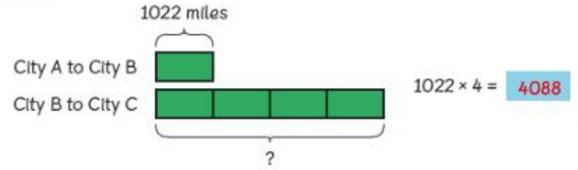
Multiply proper fractions and mixed numbers by whole numbers.

The distance between City B and City C is 4 times the distance between City A and City B. How can we work out the distance between City A and City C?



Let's Learn

1



$$1022 \times 4 = 4088$$

Lulu bought eight $\frac{2}{3}$ l bottles of fruit punch.

How much fruit punch did she buy?

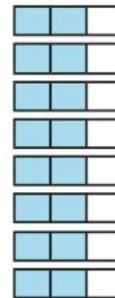
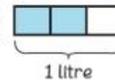
She also bought 8 pies for a party.

$\frac{2}{3}$ of them were eaten.

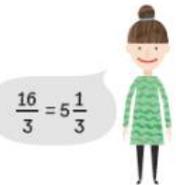
How many pies were eaten?

Let's Learn

1



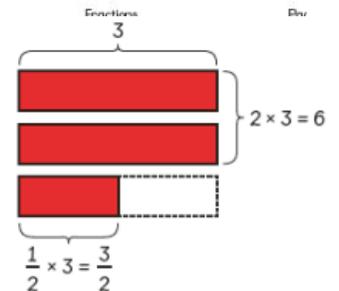
$$\begin{aligned} 8 \times \frac{2}{3} &= 8 \times 2 \text{ thirds} \\ &= 16 \text{ thirds} \\ &= \frac{16}{3} \end{aligned}$$



She bought $5\frac{1}{3}$ litres of fruit punch.

1

$$\begin{aligned} 2\frac{1}{2} \times 3 &= 6 + \frac{3}{2} \\ &= 6 + 1\frac{1}{2} \\ &= 7\frac{1}{2} \end{aligned}$$



Division

Divide numbers up to 4 digits by a one-digit number using formal written methods and interpret remainders appropriately for the context

$$3 \overline{) 42} \quad \rightarrow \quad 3 \overline{) \begin{array}{r} 3 \\ 4 \\ 2 \end{array}}$$

(a) $98 \div 7 = 14$

$$7 \overline{) 98}$$

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

(b) $342 \div 6 = 57$

$$6 \overline{) 342}$$

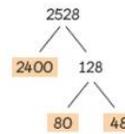
$$\begin{array}{r} 57 \\ 6 \overline{) 342} \\ \underline{30} \\ 42 \\ \underline{42} \\ 0 \end{array}$$

$$5 \overline{) \begin{array}{r} 75 \\ 37 \\ 26 \end{array}} \text{ remainder } 1$$

2  's story

2528 ml of juice is put into 8 containers so that each container holds the same volume. What is the volume of juice in each container?

$2528 \text{ ml} \div 8 = 316$



$$\begin{array}{r} 316 \\ 8 \overline{) 2528} \\ \underline{24} \\ 128 \\ \underline{128} \\ 0 \end{array}$$

$2400 \div 8 = 300$

$80 \div 8 = 10$

$48 \div 8 = 6$



Solve multi-step / multi-operational problems

Solve addition and subtraction, multiplication and division multi-step problems in contexts, deciding which operations and methods to use and why.

In Focus



 baked 6 batches of cupcakes.
 Each batch was made up of 8 trays of .
 Sam packed the cupcakes into boxes of 4.
 Find the number of boxes he got.
 What if Sam packed the cupcakes into boxes of 7?



Let's Learn

1 Understand the problem.



How many  are there on each tray?

How many trays are there in one batch?

Make a plan.



Find the total number of trays of cupcakes.

Then find the number of .

Carry out the plan.



$$6 \times 8 \text{ trays} = 48 \text{ trays}$$

$$48 \times 12 \text{ cupcakes} = 576 \text{ cupcakes}$$



$$576 \div 4 = 144$$

$$\begin{array}{r} 144 \\ 4 \overline{) 576} \\ \underline{- 400} \\ 176 \\ \underline{- 160} \\ 16 \\ \underline{- 16} \\ 0 \end{array}$$

Sam got 144 .

Check your answer.

$$144 \times 4 = 576$$



100 boxes \rightarrow 400
 50 boxes \rightarrow 200
 150 boxes \rightarrow 600

144 is just less than 150, so the answer seems reasonable.

$$\begin{array}{r} 114 \\ \times 4 \\ \hline 576 \end{array}$$

2 What if Sam packed the cupcakes into boxes of 7?

$$576 \div 7 = 82 \text{ remainder } 2$$

Sam got 82 boxes and 2 cupcakes left over.

$$\begin{array}{r} 82 \\ 7 \overline{) 576} \\ \underline{- 56} \\ 16 \\ \underline{- 14} \\ 2 \end{array}$$



In Focus

and share the sum of these two amounts

so that gets 3 times as much as

How much more than will get?



Let's Learn

1 Understand the problem. How much money are they sharing? Are they sharing equally?

Make a plan and carry out the plan.

Add to find the total. £3597 + £1259 = £4856

Use a model. £4856 ÷ 4 = £1214

£1214 × 3 = £3642

£1214

gets £3642 - £1214 = £2428 more than gets.

$$\begin{array}{r} 11 \\ 3597 \\ + 1259 \\ \hline 4856 \\ 4 \overline{) 4856} \\ \underline{- 4} \\ 856 \\ \underline{- 8} \\ 56 \\ \underline{- 4} \\ 16 \\ \underline{- 16} \\ 0 \end{array}$$

Check your answer.



I get £3642.



I get £1214.

Are the amounts reasonable?

Percentages

Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal

In Focus



Out of 10 throws, I scored 7.

Out of 20 throws, I scored 13.

Out of 25 throws, I scored 15.

Whose score is the best?

Let's Learn

1  's method

	7
	15
	13

This is the best score!

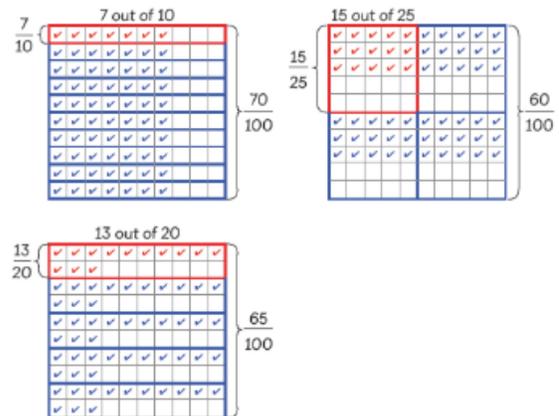
What is wrong with  's method?

When does  's method work?

2  's method

	$\frac{7}{10} = \frac{70}{100} = 70\%$
	$\frac{15}{25} = \frac{60}{100} = 60\%$
	$\frac{13}{20} = \frac{65}{100} = 65\%$

This is the best score!



3  's method

	$\frac{7}{10} = 0.7$
	$\frac{15}{25} = \frac{60}{100} = 0.6$
	$\frac{13}{20} = \frac{65}{100} = 0.65$

This is the best score!

Addition

Add fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

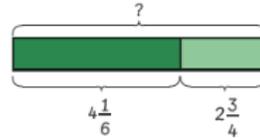
In Focus

Find the mass of ? in each case.



Let's Learn

1 $4\frac{1}{6} + 2\frac{3}{4} = 6\frac{11}{12}$



$$4\frac{1}{6} + 2\frac{3}{4} = 4\frac{2}{12} + 2\frac{9}{12}$$

$$= 6\frac{11}{12}$$

$$\frac{1}{6} = \frac{2}{12}$$

$$\frac{3}{4} = \frac{9}{12}$$

Why did we use 12 as a common denominator?

What if it is $4\frac{5}{6} + 2\frac{3}{4}$?

has a mass of $6\frac{11}{12}$ kg.

Add using negative numbers.

$-4 + 3 = -1$



$-4 + 3 = -1$

We read -1 as 'negative one'.

-1 is 1 less than 0.

Add increasingly larger numbers using formal column addition, including decimals.

	23	·	36	
	9	·	08	0
	59	·	77	0
+	1	·	30	0
	93	·	51	1
	2	·	1	

Adding several numbers with different numbers of decimal places (including money and measures):

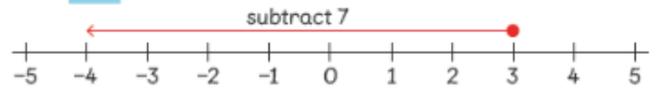
- Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.

Empty decimal places should be filled with zero to show

Subtraction

Subtract using negative numbers.

$$3 - 7 = -4$$



$$3 - 7 = -4$$

We read -4 as 'negative four'.



-4 is 4 less than 0.

Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

In Focus

Emma and Elliott have $1\frac{1}{3}$ bars of chocolate between them.



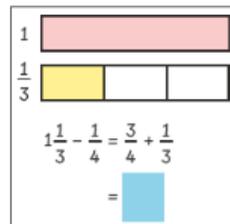
What is left if takes $\frac{1}{4}$ of ?

What is left if takes $\frac{3}{4}$ of ?

Let's Learn

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

Method 1



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

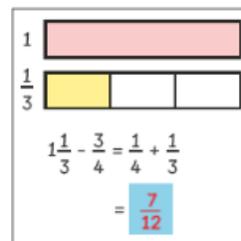
$$\frac{3}{4} = \frac{6}{8} = \frac{9}{12}$$

$$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{4}{12}$$



2 $1\frac{1}{3} - \frac{3}{4} = \frac{7}{12}$

Method 1



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

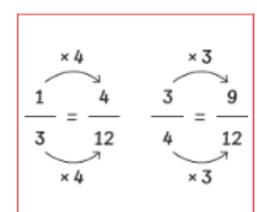


Method 2

$$1\frac{1}{3} - \frac{3}{4} = 1\frac{4}{12} - \frac{9}{12}$$

$$= \frac{16}{12} - \frac{9}{12}$$

$$= \frac{7}{12}$$



Subtract increasingly large numbers using formal written methods, including decimals.

$$\begin{array}{r} 80699 \\ - 89949 \\ \hline 60750 \end{array}$$

$$\begin{array}{r} 15.19 \text{ kg} \\ 36.08 \text{ kg} \\ \hline 69.33 \text{ kg} \end{array}$$

Multiplication

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.

$$12 \times 568 = 6816$$

$$\begin{array}{r} 568 \\ \times 12 \\ \hline 1136 \rightarrow 568 \times 2 \\ + 5680 \rightarrow 568 \times 10 \\ \hline 6816 \end{array}$$

Multiply simple pairs of proper fractions, writing the answer in its simplest form.

4 $24 \times 2568 = 61\,632$

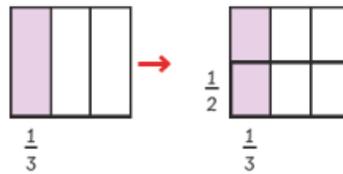
$$\begin{array}{r} 2\ 2\ 3 \\ 2\ 5\ 6\ 8 \\ \times \quad 2\ 4 \\ \hline 1\ 0\ 2\ 7\ 2 \\ 2568 \times 4 \end{array}$$

$$\begin{array}{r} 1\ 1\ 1 \\ 2\ 2\ 3 \\ 2\ 5\ 6\ 8 \\ \times \quad 2\ 4 \\ \hline 1\ 0\ 2\ 7\ 2 \\ 5\ 1\ 3\ 6\ 0 \\ 2568 \times 20 \end{array}$$

$$\begin{array}{r} 1\ 1\ 1 \\ 2\ 2\ 3 \\ 2\ 5\ 6\ 8 \\ \times \quad 2\ 4 \\ \hline 1\ 0\ 2\ 7\ 2 \\ + 5\ 1\ 3\ 6\ 0 \\ \hline 6\ 1\ 6\ 3\ 2 \end{array}$$

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

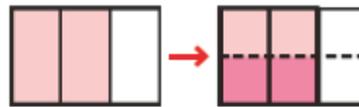
Let  be a pizza.



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

Taking $\frac{1}{2}$ of $\frac{1}{3}$ creates sixths.

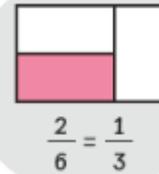
$\frac{1}{2} \times \frac{2}{3} = \frac{1}{3}$



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

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

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

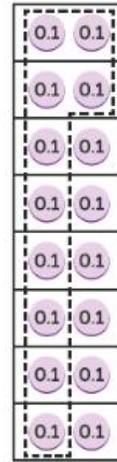


Multiply one-digit numbers with up to two decimal places by whole numbers.

1 $1.2 \times 8 = 9.6$



$$1.2 \times 8 = 8 + 1.6 = 9.6$$



$1 \times 8 = 8$

$0.2 \times 8 = 1.6$



2 $1.2 \times 8 = 9.6$

$$1.2 \times 8 = 12 \text{ tenths} \times 8 = 96 \text{ tenths} = 9.6$$

1.2 = 12 tenths



$$\begin{array}{r} 1.2 \\ \times 8 \\ \hline 9.6 \end{array}$$

3 $1.02 \times 8 = 8.16$



$$1.02 \times 8 = 8 + 0.16 = 8.16$$



$1 \times 8 = 8$

$0.02 \times 8 = 0.16$



4 $1.02 \times 8 = 8.16$

$$1.02 \times 8 = 102 \text{ hundredths} \times 8 = 816 \text{ hundredths} = 8.16$$

1.02 = 102 hundredths



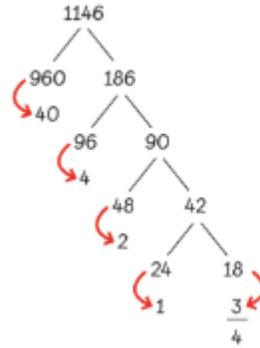
$$\begin{array}{r} 1.02 \\ \times 8 \\ \hline 8.16 \end{array}$$

Division

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

$$\begin{array}{r} 5 \\ 96 \overline{) 500} \\ \underline{- 480} \\ 20 \end{array} \rightarrow 5 \times 96 = 480$$

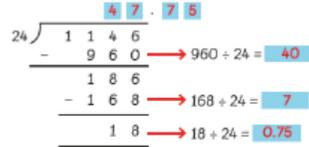
1 $£1146 \div 24 = £47.75$



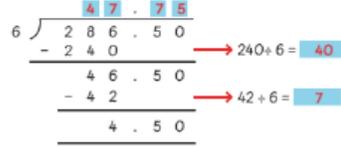
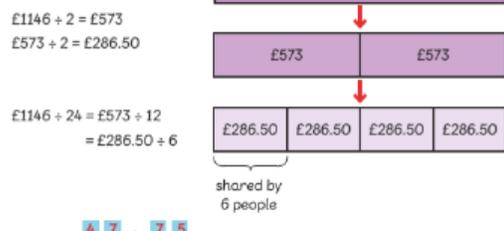
$18 \div 24 = \frac{18}{24} = \frac{3}{4}$



2 $£1146 \div 24 = £47.75$

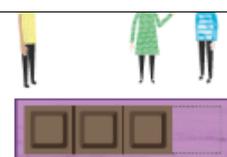


3 $£1146 \div 24 = £47.75$



Divide proper fractions by whole numbers.

How can  share $\frac{3}{4}$ of a bar of chocolate with 2 friends so that each of them gets the same amount of chocolate?



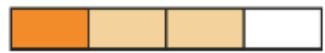
Let's Learn

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



Each person gets $\frac{1}{4}$ of the bar of chocolate.

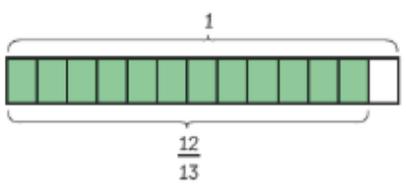
2 $\frac{3}{4} \div 3 = \frac{1}{3} \times \frac{3}{4}$



I receive a fraction of $\frac{3}{4}$ of the bar.

Divide.

(a) $\frac{12}{13} \div 2 = \frac{6}{13}$



(b) $\frac{12}{13} \div 3 = \frac{4}{13}$

(c) $\frac{12}{13} \div 4 = \frac{3}{13}$

(d) $\frac{12}{13} \div 6 = \frac{2}{13}$

1  makes $\frac{3}{4} \div 6 = \frac{1}{8}$.

Is she correct?

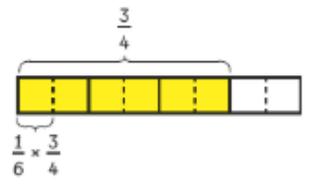
Method 1
$$\frac{3}{4} \div 6 = \frac{6}{8} \div 6$$

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



Method 2
$$\frac{3}{4} \div 6 = \frac{1}{6} \times \frac{3}{4}$$

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



 is correct.

Divide a 1-digit number with up to two decimal places by 2-digit whole numbers.

2  makes $\frac{2}{4} \div 3 = \frac{1}{6}$.

Is he correct?

Method 1

$$\begin{aligned} \frac{2}{4} \div 3 &= \frac{6}{12} \div 3 \\ &= \frac{2}{12} \\ &= \frac{1}{6} \end{aligned}$$

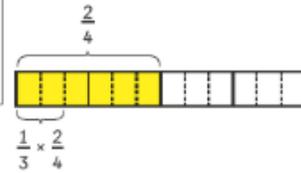
$\frac{2}{4} = \frac{6}{12}$



$\frac{2}{12} = \frac{1}{6}$

Method 2

$$\begin{aligned} \frac{2}{4} \div 3 &= \frac{1}{3} \times \frac{2}{4} \\ &= \frac{1}{6} \end{aligned}$$

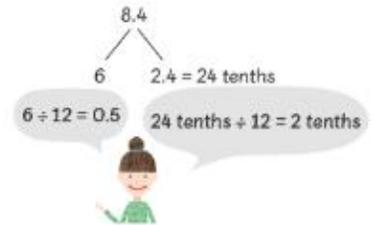


 is correct.

1 $8.4 \div 12 = 0.7$

Method 1

$$\begin{aligned} 8.4 \div 12 &= 0.5 + 0.2 \\ &= 0.7 \end{aligned}$$



Method 2

$$\begin{aligned} 8.4 &= 84 \text{ tenths} \\ 84 \text{ tenths} \div 12 &= 7 \text{ tenths} \\ &= 0.7 \end{aligned}$$



$8.4 \text{ kg} \div 12 = 0.7 \text{ kg}$

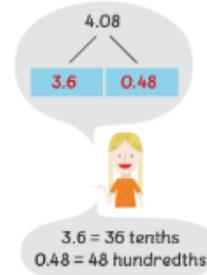
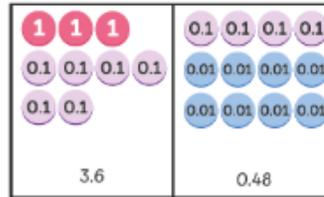
In Focus

How should we rename 4.08 to calculate $4.08 \div 12$?



Let's Learn

1 $4.08 \div 12 = 0.34$

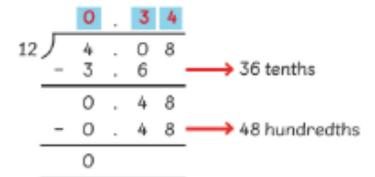


$$36 \text{ tenths} \div 12 = 3 \text{ tenths} = 0.3$$

$$48 \text{ hundredths} \div 12 = 4 \text{ hundredths} = 0.04$$

$$4.08 \div 12 = 0.3 + 0.04 = 0.34$$

2 $4.08 \div 12 = 0.34$



Problem solving with all four operations

solve problems involving addition, subtraction, multiplication and division
 solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

In Focus

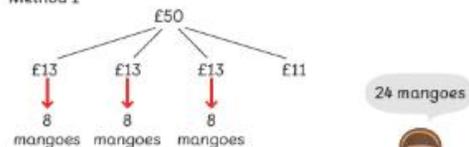
What is the greatest number of mangoes that can be bought with £50?



Let's Learn

1 How many mangoes can be bought with £50?

Method 1

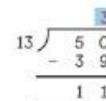


$$8 + 8 + 8 = 24$$

Method 2

$$£50 \div £13 = 3 \text{ remainder } £11$$

$$3 \times 8 = 24$$



In Focus

 took 1 h 50 min to bake first a sponge cake, then a butter cake and then a brownie. The butter cake took twice as long to bake as the brownie. The brownie took 10 minutes more than the sponge cake.

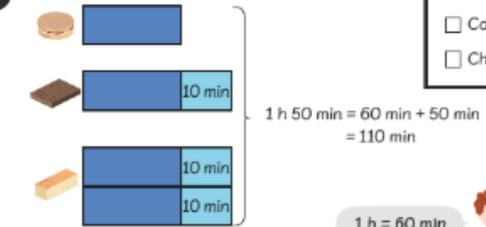
Baking time	
	twice as much time as 
	10 minutes more than 

Is it possible to find the time it takes to bake a sponge cake?

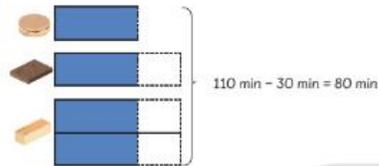
Let's Learn

- Understand
- Plan
- Calculate
- Check

1



1 h = 60 min



$$4 \text{ units} = 80 \text{ min}$$

$$1 \text{ unit} = 80 \text{ min} \div 4$$

$$= 20 \text{ min}$$

The sponge cake took 20 min to bake.

How long did it take to bake the butter cake and the brownie?



2



$$4 \text{ units} = 120 \text{ min}$$

$$1 \text{ unit} = 120 \text{ min} \div 4$$

$$= 30 \text{ min}$$

It took 30 min to bake the brownie.

It took 60 min to bake the butter cake.

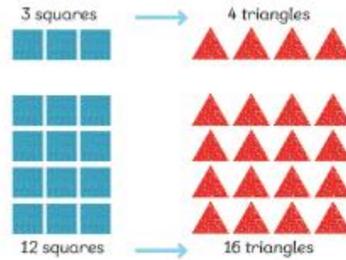
In Focus

 wants to make 20 identical squares and 12 identical equilateral triangles using wire.



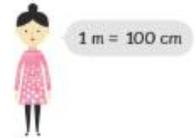
He has made 12 squares and 9 triangles using 6 m of wire. The length of wire used for 3 squares is the same as that used for 4 triangles. Find the total length of wire  needs to make all 20 squares and 12 triangles.

Let's Learn

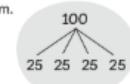
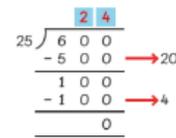


- Understand
- Plan
- Calculate
- Check

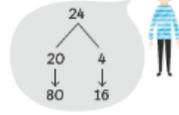
12 squares and 9 triangles need 6 m = 600 cm.
16 triangles and 9 triangles need 600 cm.
25 triangles need 600 cm.



1 triangle needs $600 \text{ cm} \div 25 = 24$ cm.

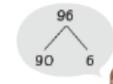
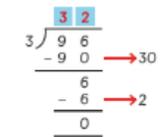


4 triangles need $24 \text{ cm} \times 4 = 96$ cm.



3 squares need 96 cm.

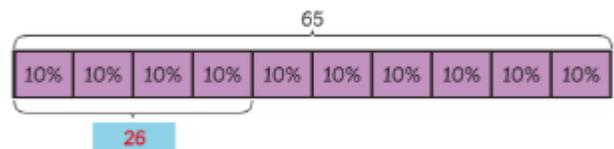
1 square needs $96 \text{ cm} \div 3 = 32$ cm.



Percentages

Calculate percentages of quantities and numbers.

2 40% of 65 = 26



10% → $65 \div 10 = 6.5$
40% → $4 \times 6.5 = 26$

In Focus

Ingredients for lemonade

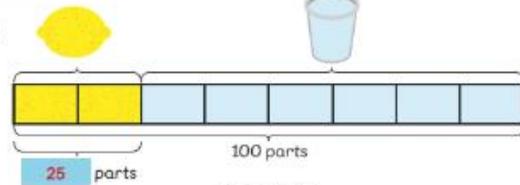
6 cups (1.35 l) cold water
2 cups (450 ml) lemon syrup
a pinch of salt



mixes the cold water and the lemon syrup. Out of 100, how many parts of the mixture is lemon syrup?

Let's Learn

1



25 out of 100 parts of the mixture is lemon syrup.
25% of the mixture is lemon syrup.

That means for every 100 ml of mixture, 25 ml is lemon syrup.



2

wants to prepare a 2-litre batch of lemonade. How much lemon syrup does he need?

$$2 \text{ l} = 2000 \text{ ml}$$

Method 1

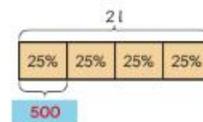
For every 100 ml, needs 25 ml of lemon syrup.

For every 1000 ml, needs 250 ml of lemon syrup.

For every 2000 ml, needs 500 ml of lemon syrup.



Method 2



$$2 \text{ l} \div 4 = 2000 \text{ ml} \div 4 \\ = 500 \text{ ml}$$

Method 3

$$\begin{aligned} 25\% \text{ of } 2 \text{ l} &= \frac{25}{100} \times 2000 \text{ ml} \\ &= \frac{1}{4} \times 2000 \text{ ml} \\ &= 500 \text{ ml} \end{aligned}$$