St Mary's RC Primary School and Nursery,
a Voluntary Academy

Calculations Policy

Vision: 'A Journey to Excellence'

We believe that each child is made in the image and likeness of God therefore we develop the 'whole child' to reach their individual potential. We have high expectations and celebrate success both academically and socially. We aim to provide an outstanding Catholic education so that we can make a valuable contribution to the community in which we live and serve.

Mission statement

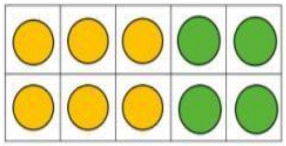
'We are happy living and learning in God's Friendship'

EYFS Calculation Policy

Number bonds using Tens frame:

Tens frame:

Children will be able to use a tens frame to find number bonds to 10.



The tens frame shows 6 + 4 = 10

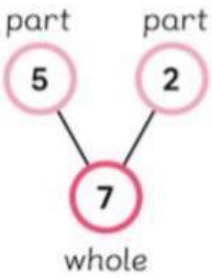
One-to-one correspondence:

Children first learn to count using one to one correspondence.

Children will be encouraged to say a number each time they touch an object.

Using physical resources:

Part-part-whole model:



Children will use the part-part-whole diagram to add and subtract numbers.

Numicon:

Children will be able to use Numicon to count, as well ordering them from smallest to biggest to create their own number line. Children should be able to see which Numicon shape is one more or one less

Number lines:

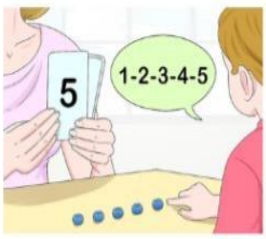
Children will be able to use a number line to count, a well as using it to take away or add one. This will be for numbers up to 20.

Part-part-whole model:

Alongside the part-part-whole diagram, children wi use Numicon and practical resources to add and subtract numbers.

Children will be confident to say and write calculations using the + and – signs.

Recognising numerals:



Children learn to recognise numerals to 20.

They are beginning to match the numeral with the correct corresponding quantity.

Years 1 - 6

Year 1 – 6

Maths- No Problem!

Maths – No Problem! is an evidence – based approach developed in Singapore. It is fully aligned with the 2014 English National Curriculum for Maths.
The Maths – No Problem! Primary Series was assessed by the DfE's expert panel, which judged that it met the core criteria for a high quality textbook to support teaching for mastery.

By incorporating established learning research into a highly effective approach, Singapore has become a "laboratory of maths teaching". The Primary Maths Series is founded on the international research of Piaget, Dienes, Bruner, Skemp and Vygotsky and has been tested and refined over the last 30 years in Singapore.

Teaching Maths for Mastery

The whole class works through the programme of study at the same pace with ample time on each topic before moving on. Ideas are revisited at higher levels as the curriculum spirals through the years.

Differentiated activities

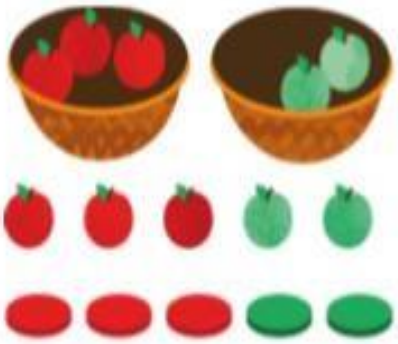
Tasks and activities are designed to be easy for children to enter while still containing challenging components. For advanced learners, the textbooks also contain non-routine questions for children to develop their higher-order thinking skills.

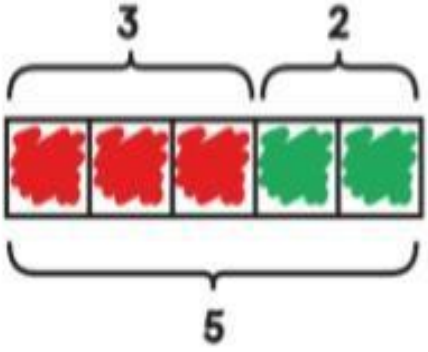
Problem Solving

Lessons and activities are designed to be taught using problem-solving approaches to encourage children's higher-level thinking. The focus is on

working with children's core competencies, building on what they know to develop their relational understanding.

Concrete, Pictorial, Abstract (CPA) approach





$3 + 2 = \boxed{5}$

Concrete Concrete is the "doing" stage. This stage brings concepts to life by allowing children to experience and handle physical (concrete) objects. For example, if a problem involves adding pieces of fruit, children can first handle actual fruit.

Pictorial Pictorial is the "seeing" stage. Here, the visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handles and the abstract pictures, diagrams or models that represent the objects from the problem.

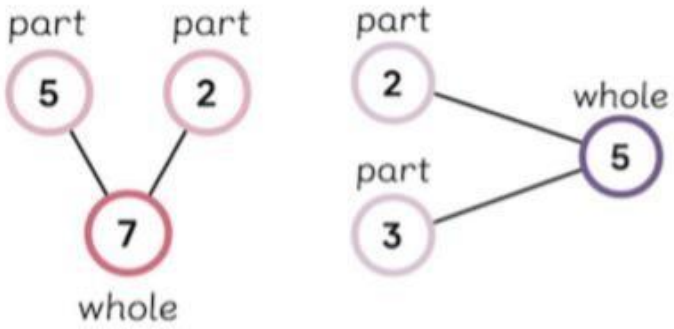
Abstract Abstract is the "symbolic" stage. Children use abstract symbols to

model problems and need a solid understanding of the concrete and pictorial stages of the problem. Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols.

Number Bonds

Number bonds show how numbers are split or combined.

An essential strategy of Singapore maths, number bonds reflect the 'part – part – whole' relationship of numbers.



Number bonds are represented by circles connected by lines.

The **'whole'** is written in the first circle, while the **'parts'** are in the adjoining circles.

Bar Modelling

Bar modelling is an essential maths mastery strategy.

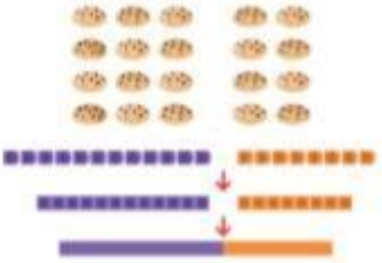
A Singapore-style of maths model, bar modelling, allows children to draw and visualise mathematical concepts to solve problems.

Sam bakes 20 cookies.
What if he gives some away?

What if Sam gives away 8 cookies?

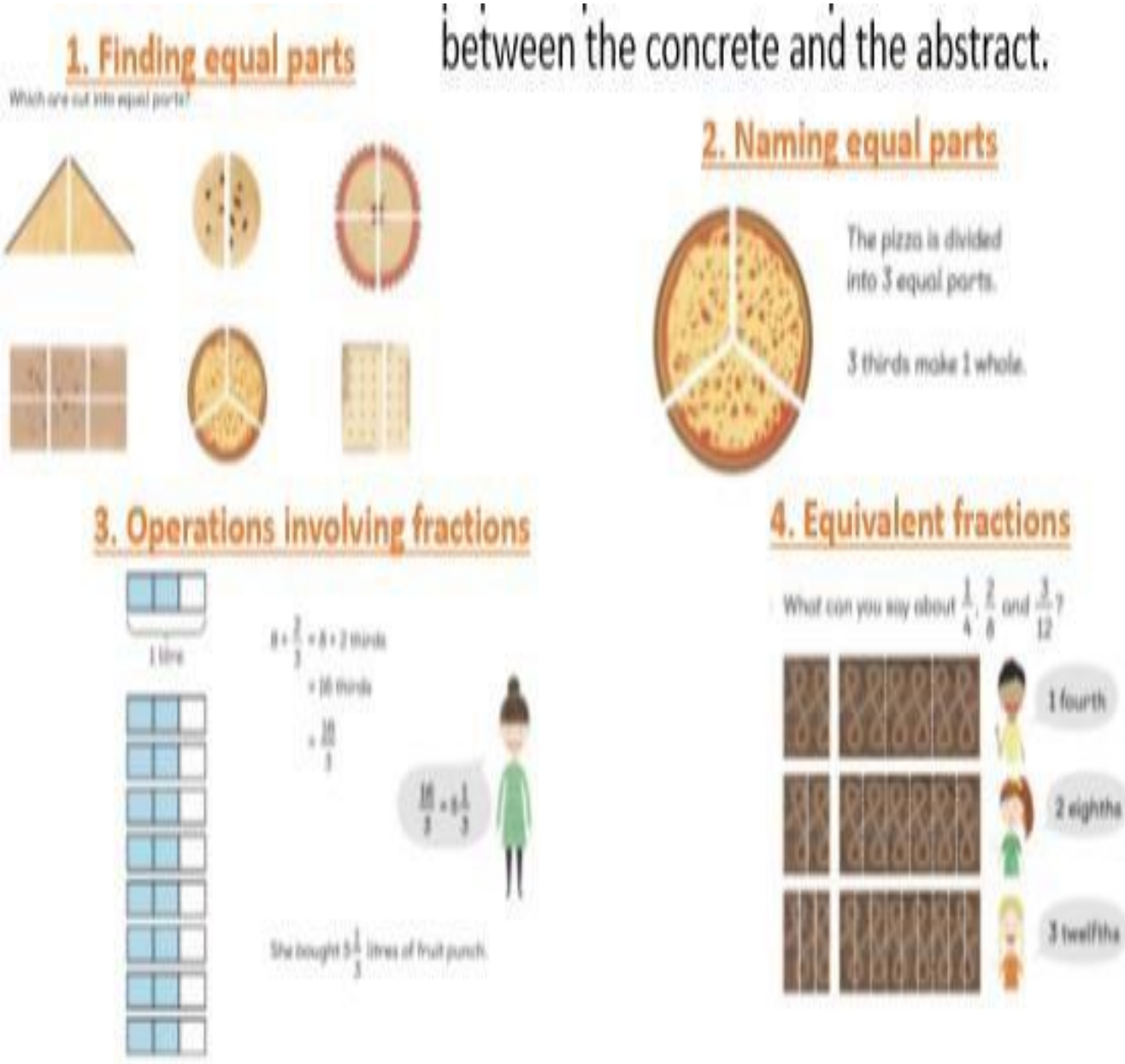
20 − 8 = ☐

Then, Sam would have ☐ cookies left.



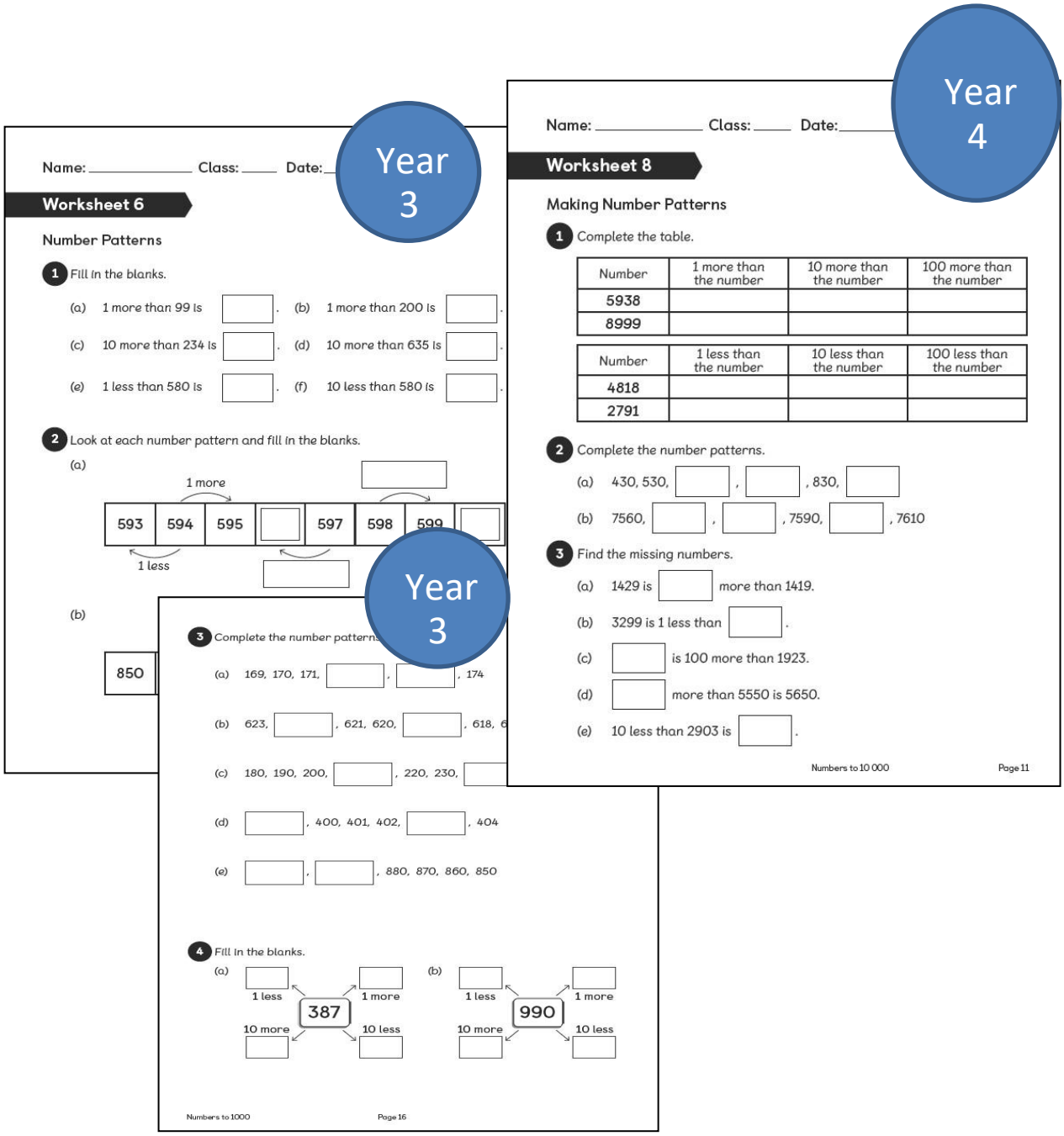
Fractions

In Singapore, the understanding of fractions is rooted in the (CPA) model, where children use paper squares and strips to learn the link between the concrete and the abstract.



Variation

The questions and examples are carefully varied by expert authors to encourage children to think about the maths. Rather than provide mechanical repetition, the examples are designed to deepen children's understanding and reveal misconceptions.



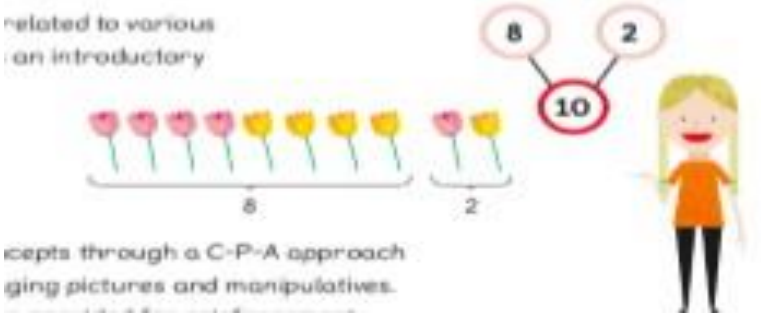
Structure of lessons

Explore

Includes questions related to various lesson objectives as an introductory activity for pupils.

Master

Introduces new concepts through CPA approach with the use of engaging pictures and manipulatives. Guided examples are provided for reinforcement.

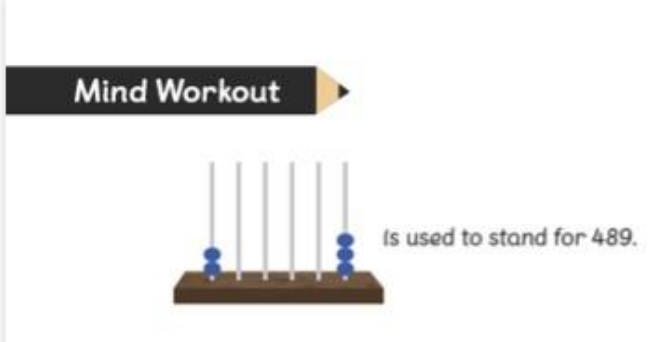


Guided Practice

Comprises
questions for further consolidation and for the immediate evaluation for children's learning.

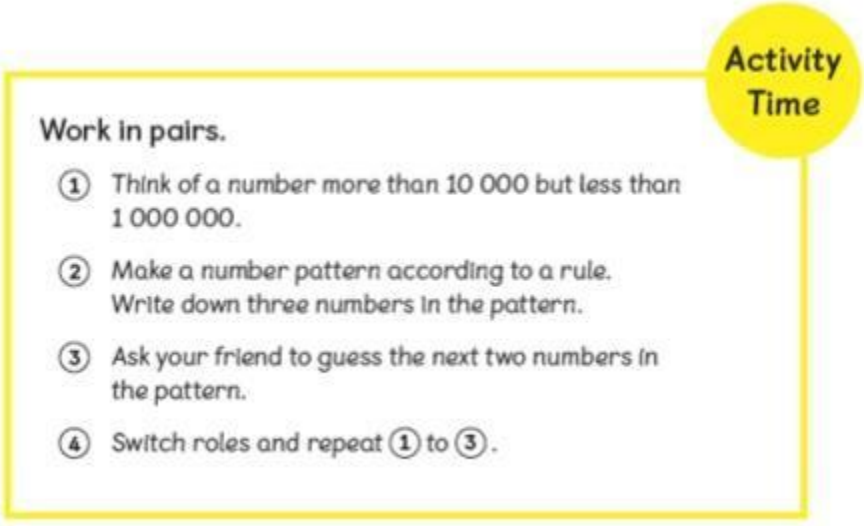
Mind Workout

Challenging non-routine questions for pupils to apply relevant heuristics and to develop higher-order thinking skills.



Activity Time

Provides pupils with opportunities to work as individuals or in small groups to explore mathematical concepts or to play games.

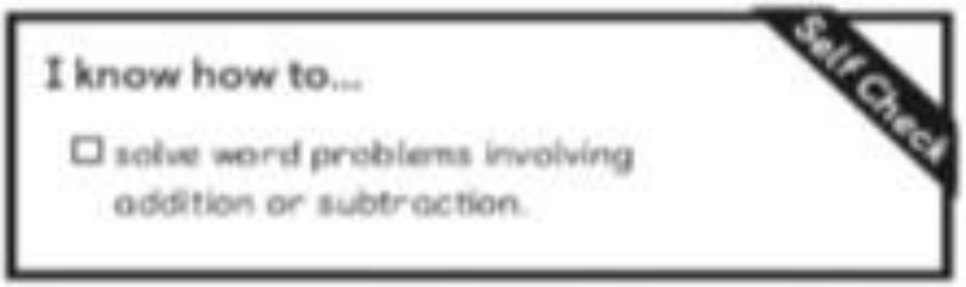


Maths Journal

Provides children with opportunities to show their understanding of the mathematical concepts learnt.

Self Check

Allows children to assess their own learning after each chapter.



What does the National Curriculum say?

KS1

Key stage 1 - years 1 and 2

- The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources.

- At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities.

- By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value.

- Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

What does the National Curriculum say?

Lower KS2

- The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

- Pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value.

- Pupils are encouraged to draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

- By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

- Pupils should read and spell mathematical vocabulary correctly and confidently, using their

What does the National Curriculum say?

growing word reading knowledge and their knowledge of spelling

Upper KS2

- The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- Pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems.
- Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- By the end of year 6, pupils should be fluent in written methods for all 4 operations, including long

What does the National Curriculum say?

multiplication and division, and in working with fractions, decimals and percentages.

- Pupils should read, spell and pronounce mathematical vocabulary correctly.

Year 1 Calculation Policy

Place Value - Counting

Year 1

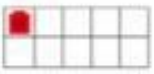
Counting to 10:

We can count on....

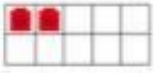
We can count back....

Then we learn about 0.

Counting with objects:



1



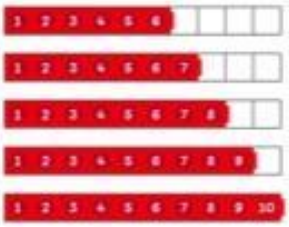
2

3

Physical objects

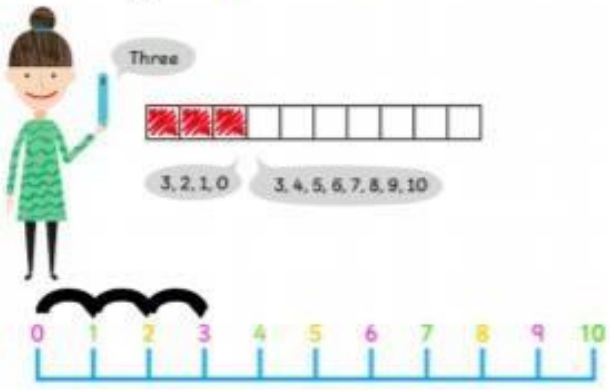
Tens squares

Counting with objects:



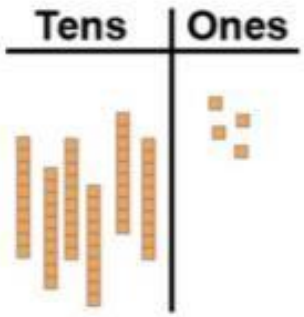
Using multilink cubes

Counting with number lines:



Place Value - Counting

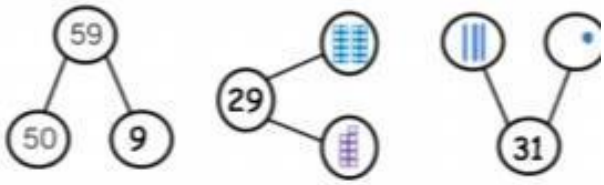
Dienes to represent numbers:



The dienes show **6 tens** and **4 ones**.

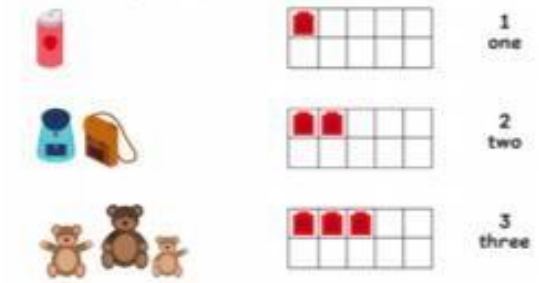
This shows the number **64**.

Number bond method:

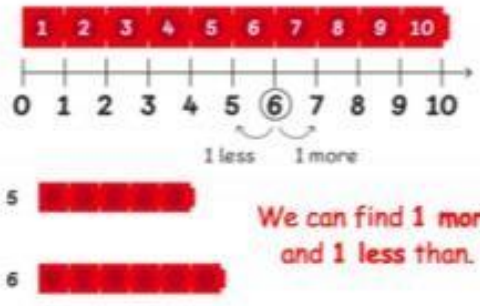


Separating the numbers apart like this is called **partitioning**.

Writing numbers to 10:



Ordering numbers:



We can find **1 more** and **1 less** than.

Comparing numbers:

There are 3 cupcakes.

There are 5 cookies.

There are 7 doughnuts.

Which number is more than the others?
Which number is less than the others?

7 is more than 5.
7 is more than 3.
7 is the **greatest**.

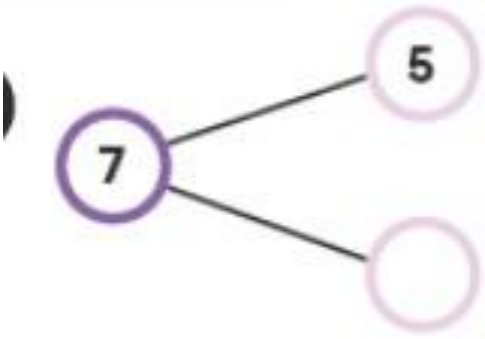
3 is less than 7.
3 is less than 5.
3 is the **smallest**.

1	2	3	4	5	6	7	8	9	10

Year 1

Addition

Abstract calculations:

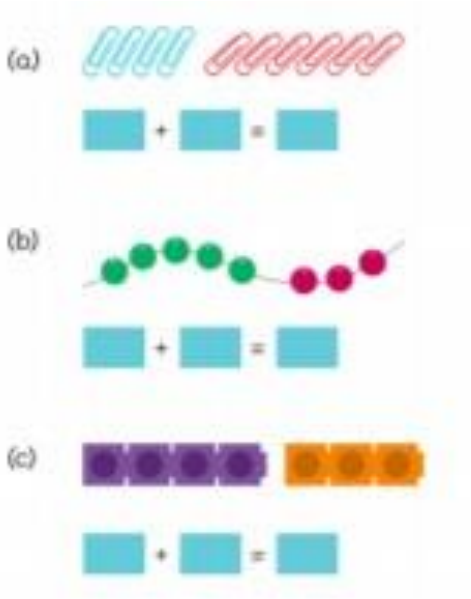


$7 = 5 + \square$

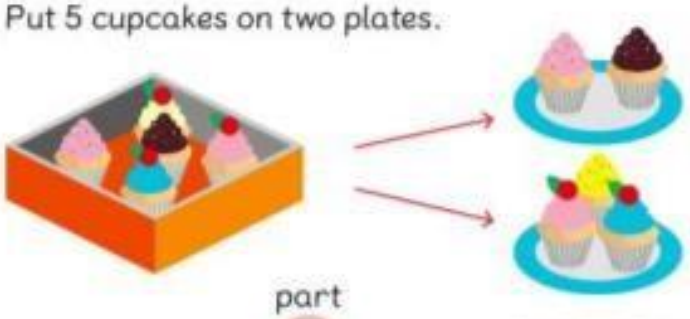
Number line method:

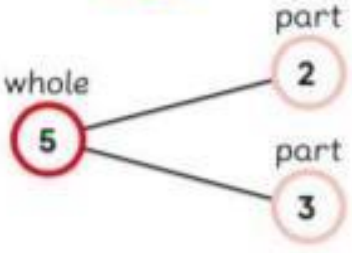
How many eggs are there in total?

$2 + 5 = 7$



Put 5 cupcakes on two plates.





2 and 3 make 5.

This is a **number bond**.

Number bond method:

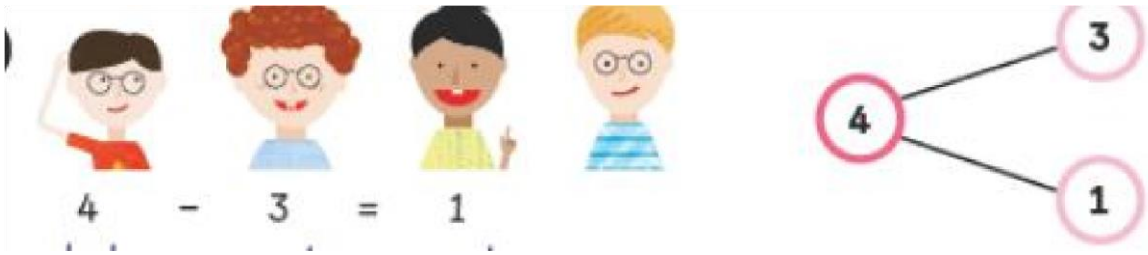
Subtraction

Pictorial Method:

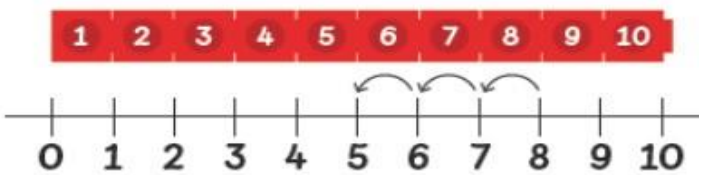
Subtract by crossing out:

7 – 2 = 5

Subtract by number bonds:

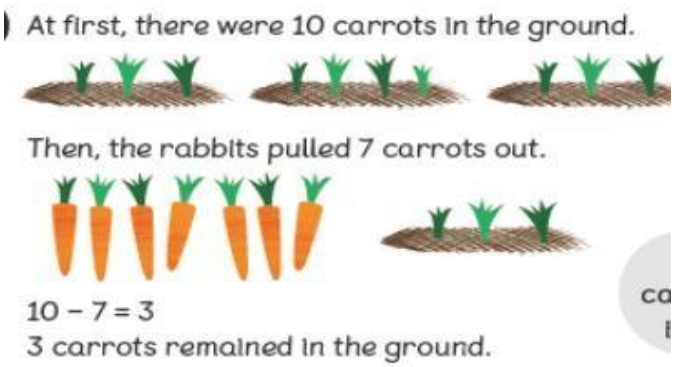


Subtract by counting back:



8 – 3 = 5
There are 5 books in the bag.

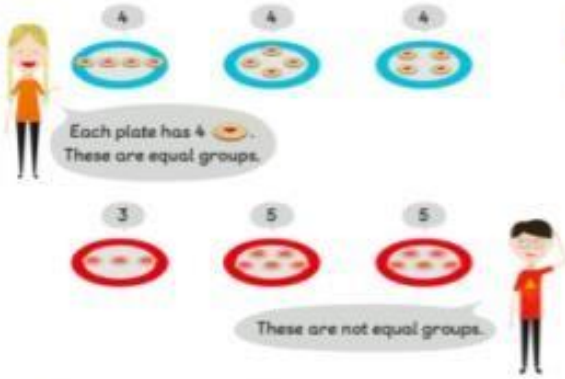
Subtract by writing stories:



Year 1

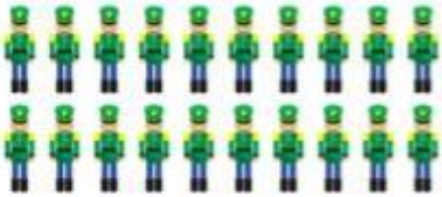
Multiplication and Division

Making equal groups



Adding equal groups

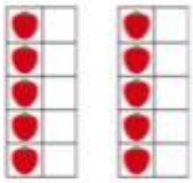
Making equal rows



10, 20

There are 10 toy soldiers in one row.
2 tens = 20
There are 20 toy soldiers altogether.

Making doubles



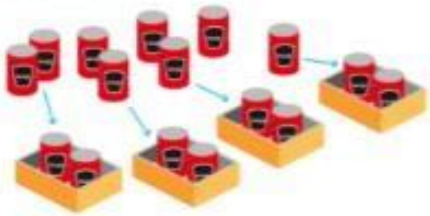
Double 2 = 4

Double 5 = 10

DIVISION

Grouping equally

There are 8 cans.



There are 4 boxes of 2 cans.

Sharing equally

There are 6 cookies and 3 children.
Each child takes one cookie.

Each child takes one more cookie.

Each child gets 2 cookies.

Year 2

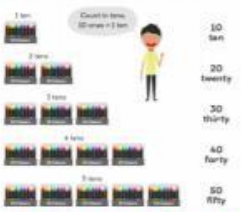
Calculation Policy

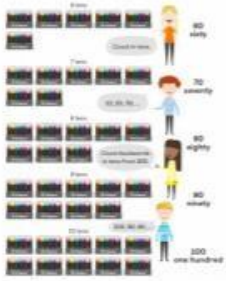
Place Value

Year 2

Counting in tens to 100:

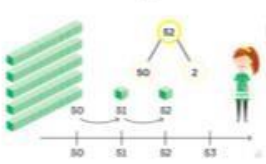
We can count on....

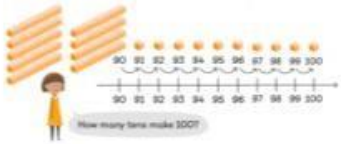




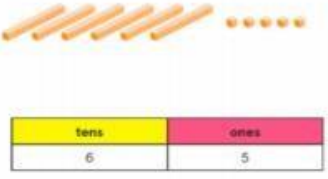
We can count back....

Counting in tens and ones:





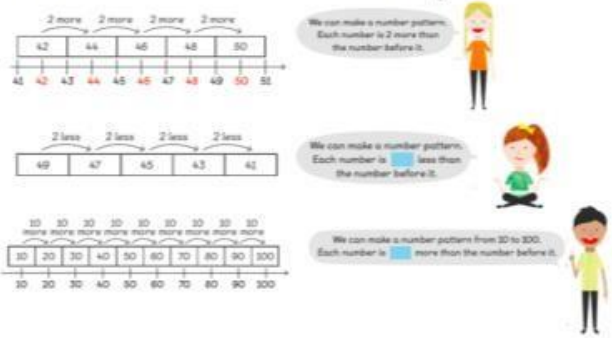
We can represent two-digit numbers in these ways:



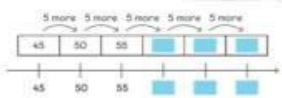
We can make numbers using different number bonds:

Comparing numbers:

We can extend number patterns:



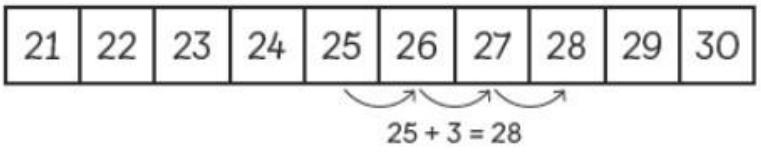
We can find the missing numbers in patterns:



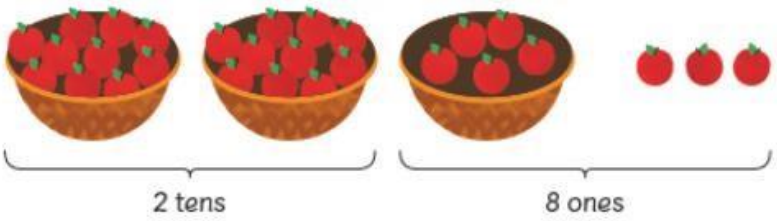
Year 2

Addition

Number line method:

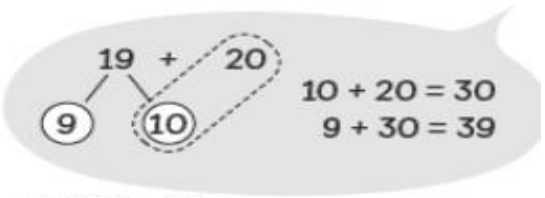


Pictorial method:



25 + 3 = 28

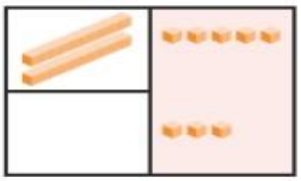
Partitioning method:



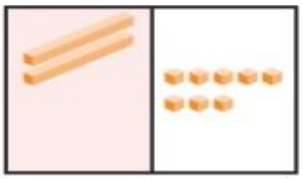
19 + 20 = 39

Deines method:

Step 1 Add the ones.
5 ones + 3 ones = 8 ones



Step 2 Add the tens.



25 + 3 = 28

Column method:

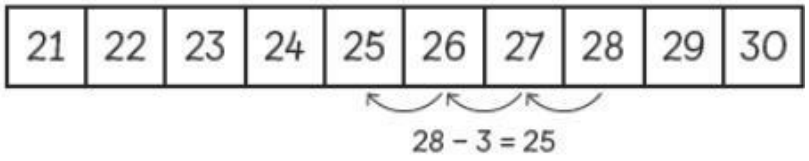
	tens	ones
	2	5
+		3
		8

	tens	ones
	2	5
+		3
	2	8

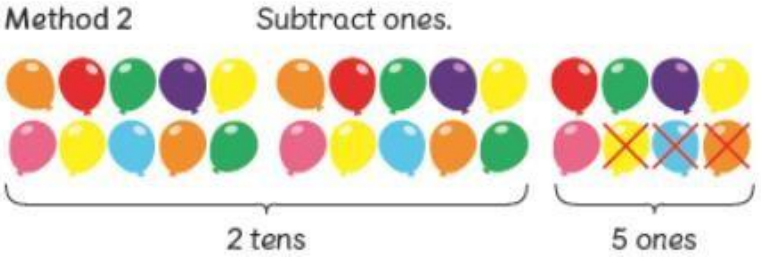
Year 2

Subtraction

Number line method:

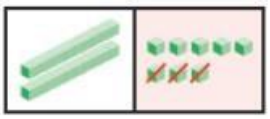


Pictorial method:



Deines method:

Step 1 Subtract the ones.
8 ones – 3 ones = 5 ones



Step 2 Subtract the tens.

28 – 3 = 25

Column method:

	tens	ones
	2	8
–		3
		5

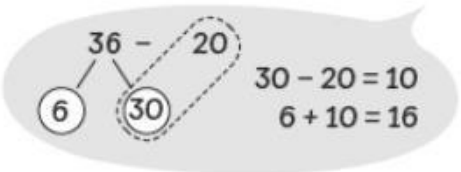
	tens	ones
	2	8
–		3
	2	5

Partitioning method:

Count back in tens from 36.

36 – 20 = 16

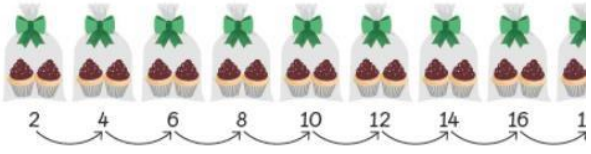
Subtract tens.



36 – 20 = 16

Year 2

Multiplication Repeated addition Pictorial to abstract:

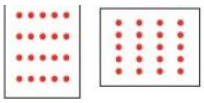


1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

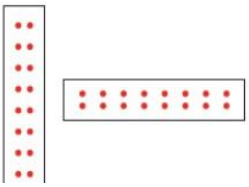
3 + 3 + 3 + 3 = 12
4 threes = 12
4 groups of 3 = 12
4 × 3 = 12

Grouping method:

(a) 4 × 5 =
5 × 4 =



(b) 8 × 2 =
2 × 8 =



How many cupcakes are there altogether?

1 stick has 2 sausages.

1 group of 2
1 × 2 = 2

2 groups of 2
2 × 2 = 4

3 groups of 2
3 × 2 = 6

Abstract Method:

Multiply.

(a) 2 × 5 =

3 × 5 =

(b) 4 × 5 =

5 × 5 =

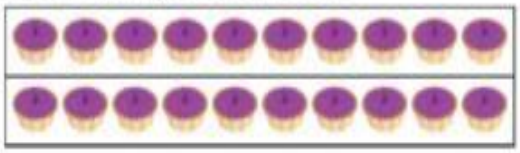
Year 2

Division

Year 2

Make a family of multiplication and division facts:

Look at the picture.
Make a family of multiplication and division facts.



2 x 10 = 20 ——— 20 ÷ 2 = 10

10 x 2 = 20 ——— 20 ÷ 10 = 2

Solving Problems

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag.
How many bags does Ruby need?

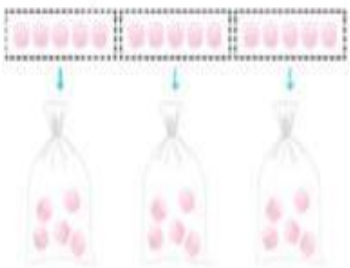
Method 1 Use  to stand for .

Use  for each bag.

Solving Problems:

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag.
How many bags does Ruby need?

Method 2 Draw a picture.



Solving Problems:

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag
How many bags does Ruby need?

Method 3 Use a division equation.

15 ÷ 5 = 3

Ruby needs 3 bags.

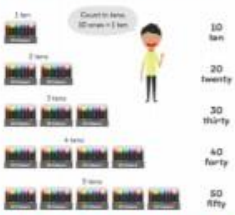
Year 3

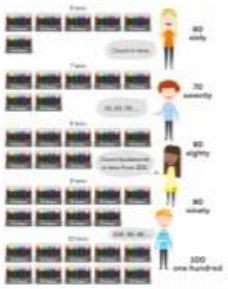
Calculation Policy

Year 3

Counting in tens to 100:

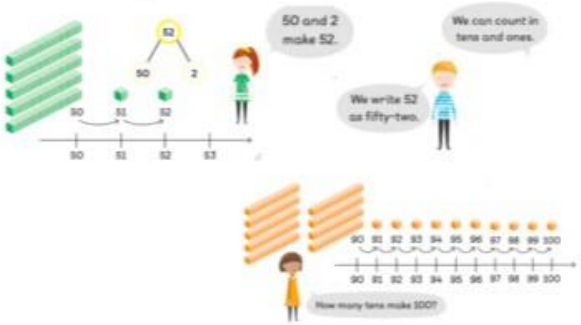
We can count on....



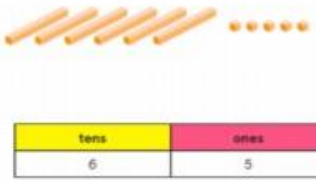


We can count back....

Counting in tens and ones:



We can represent two-digit numbers in these ways:



tens	ones
6	5

We can make numbers using different number bonds:

Place value

Year 3 Numbers to 1000

100
one hundred

200
two hundred

300
three hundred

What is the value of each digit in 530?

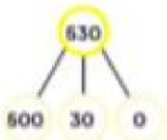
hundreds	tens	ones
5	3	0

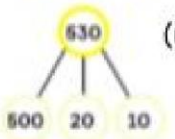
530 = ▭ hundreds + ▭ tens + ▭ ones

530 = ▭ + ▭ + ▭

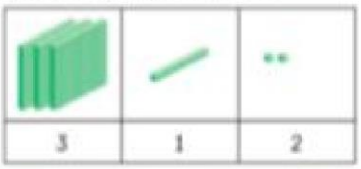
The value of the digit 5 is 500. 500
The value of the digit 3 is 30. 30
The value of the digit 0 is 0. 0

→ 530

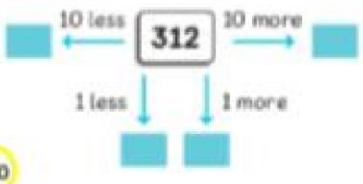




Fill in the missing numbers.



3	1	2



Number patterns
(in 1, 2, 5, 10, 3, 4 and 8)

Addition – no renaming

Adding

Recapping methods taught in Year 1 and 2

Year 3

Adding numbers to 1000

6 blue chairs

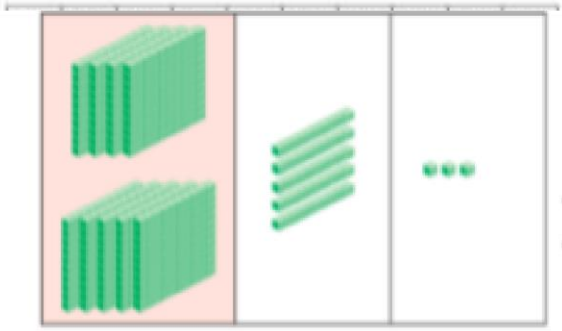
12 red chairs

How many chairs are there altogether?

We can write a family of addition and subtraction facts.

6 + 12 = 18 18 – 12 = 6

12 + 6 = 18 18 – 6 = 12



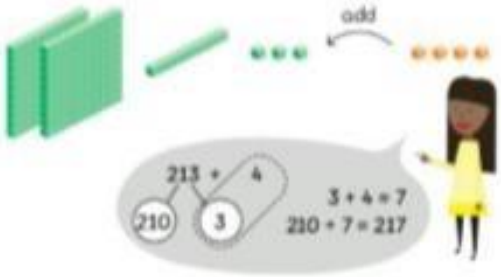
	h	t	o
	4	3	2
+	5	2	1
	9	5	3

432 + 521 = 953

Beginning practically with dienes before moving onto column addition

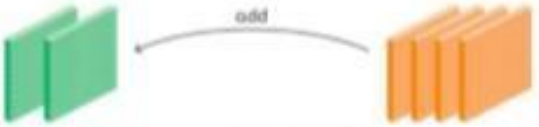
Number bond method is taught alongside both methods

Adding ones, tens and hundreds



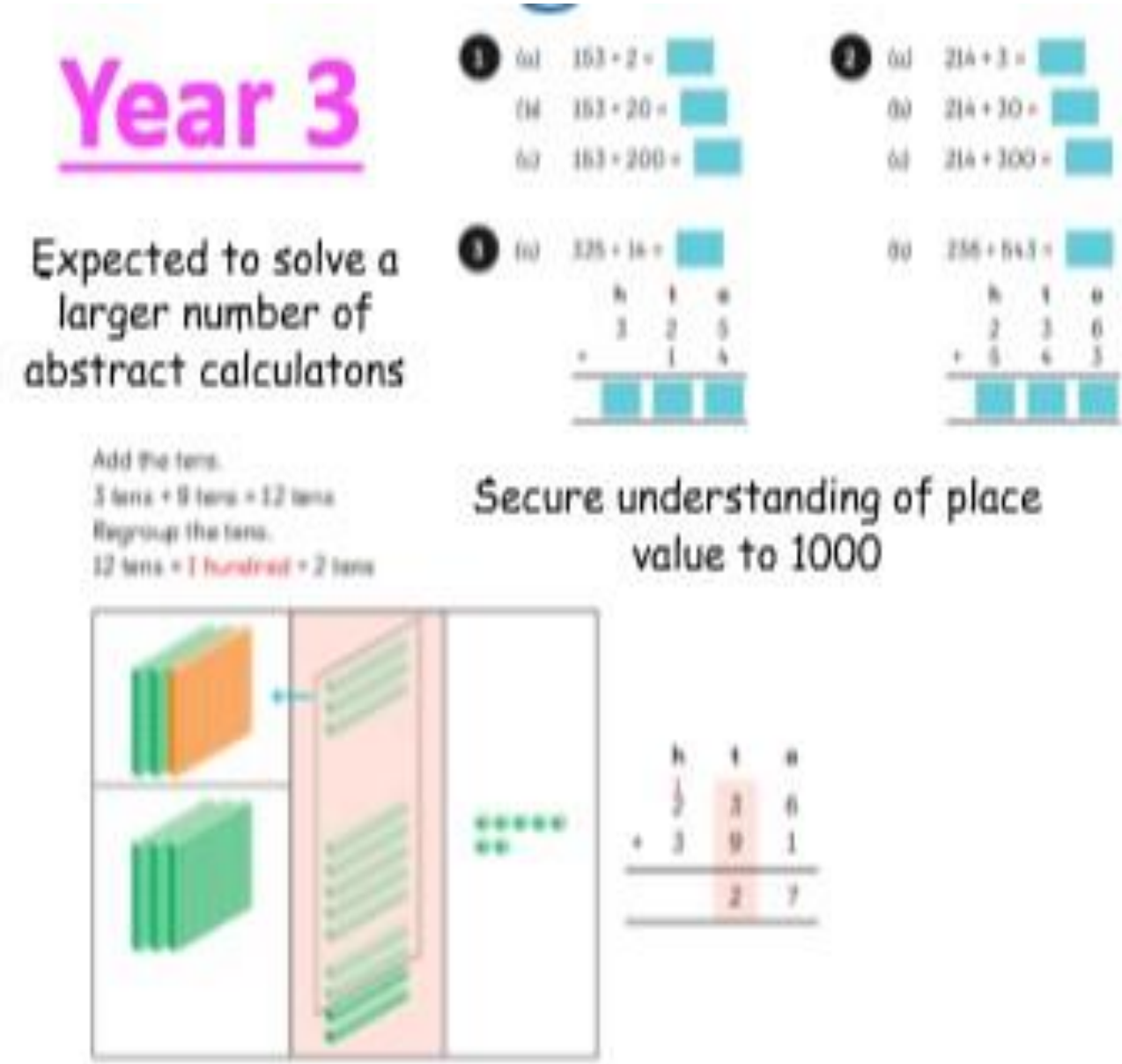
213 + 4 = 217

There were 217 books in the bookcase.

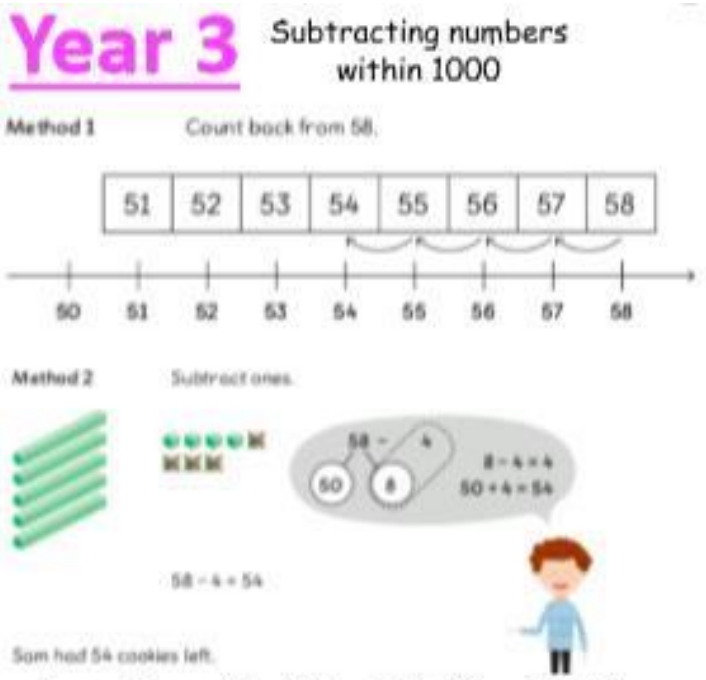


Year 3

Addition – with renaming

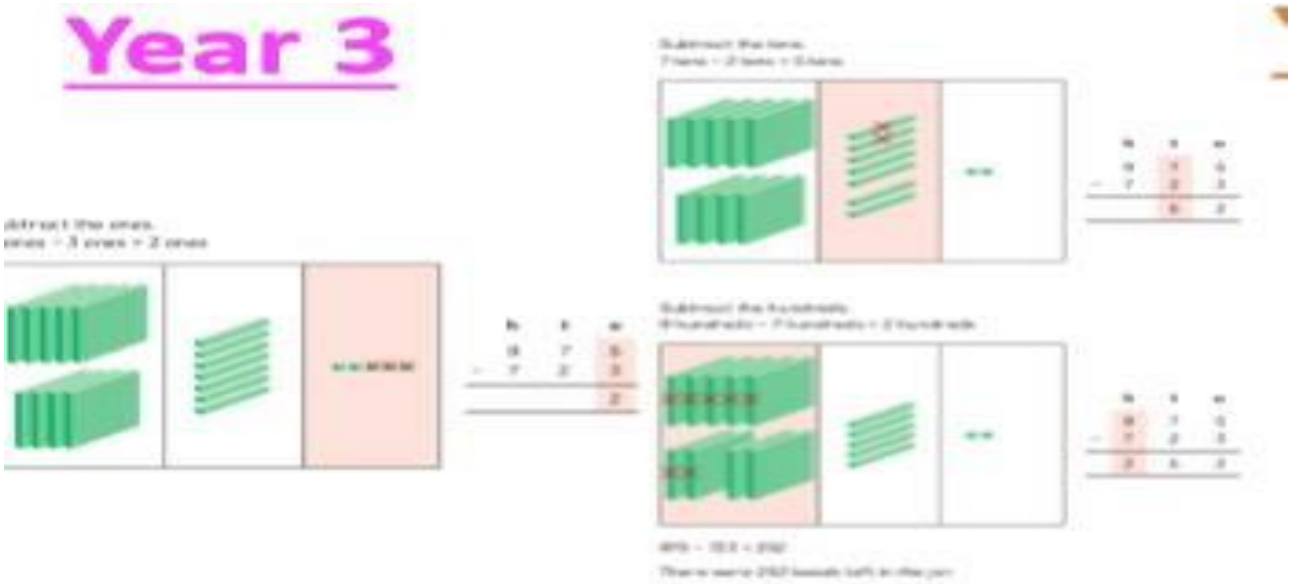


Year 3 Subtraction



Recapping methods taught in Year 1 and 2

Year 3 Subtraction – no regrouping

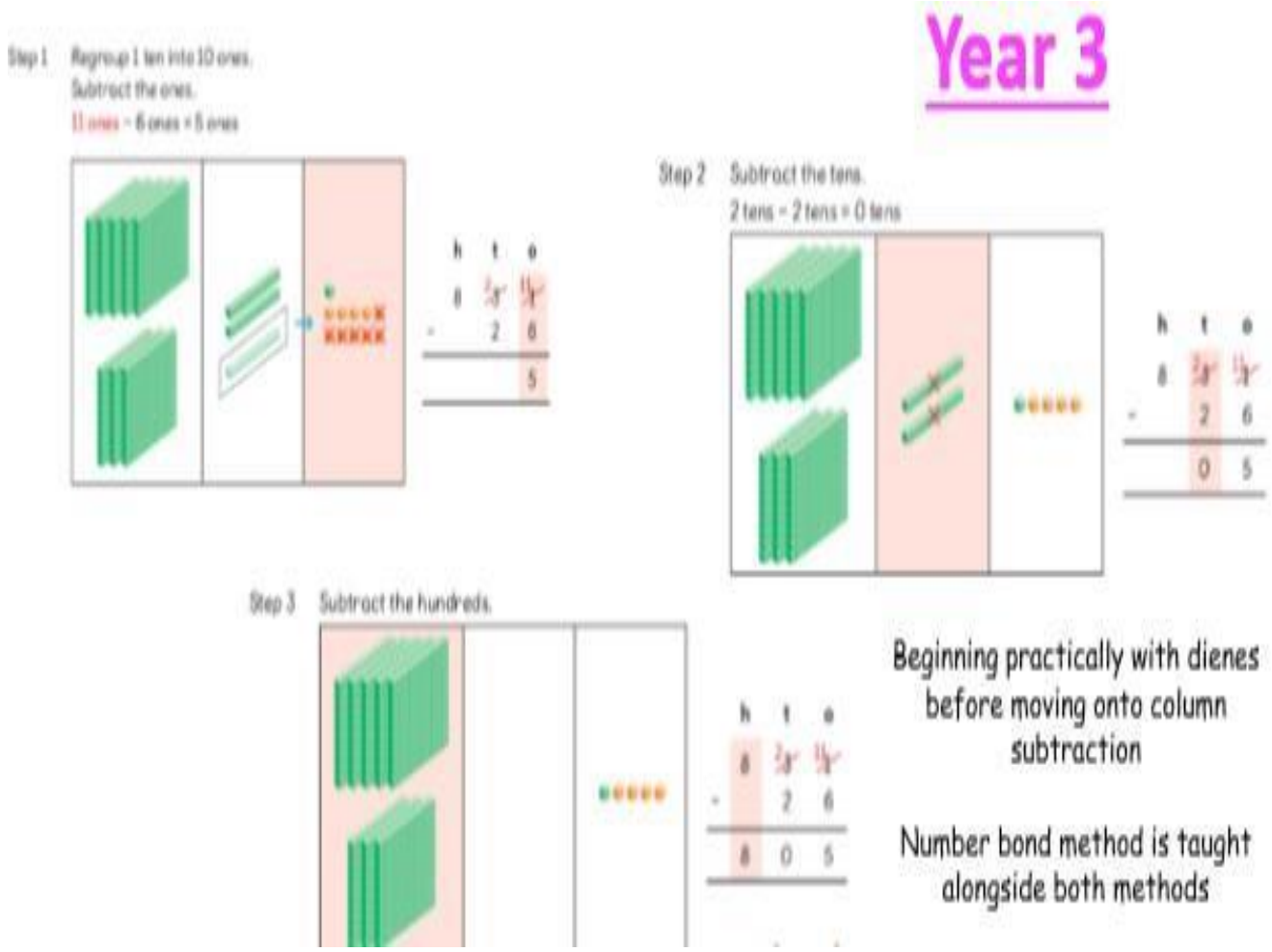


Beginning practically with dienes before moving onto column subtraction

Number bond method is taught alongside both methods

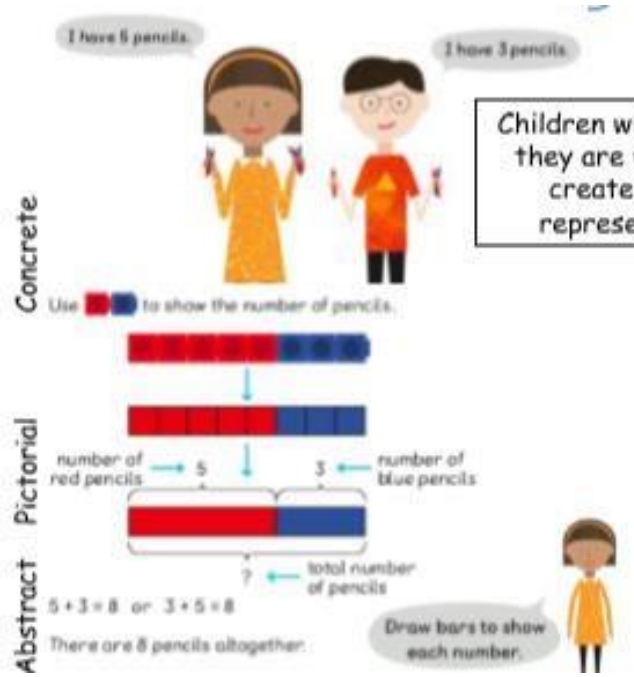
Year 3

Subtraction – with regrouping



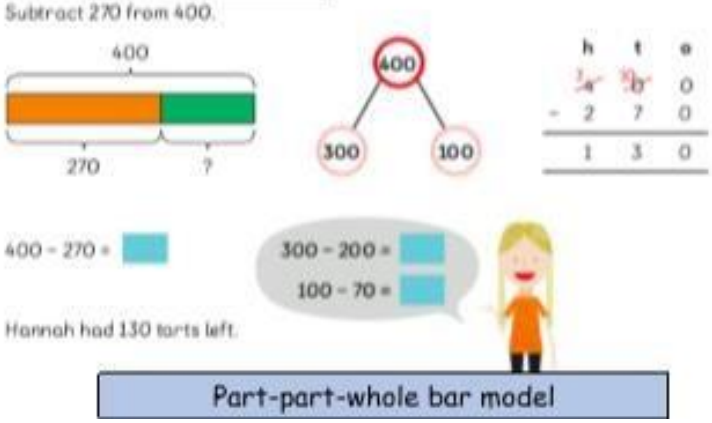
Year 3

Bar Model methods

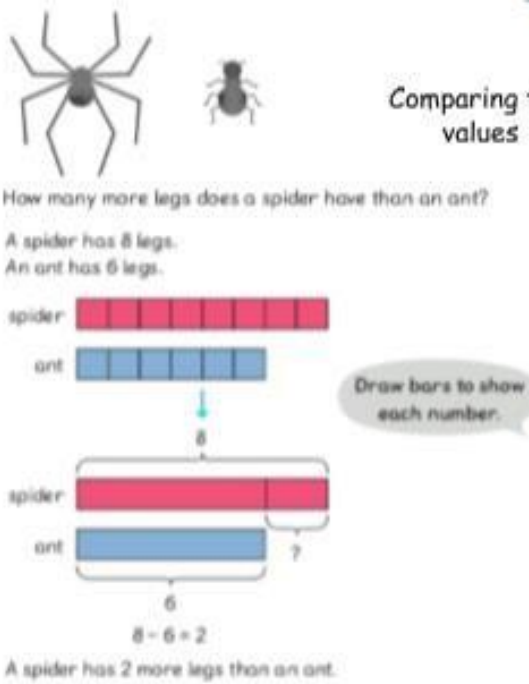


Applying addition and subtraction skills to word problems with bar models to assist

Children will be taught that the numbers they are working with are too large to create practically so a bar model represents these numbers instead

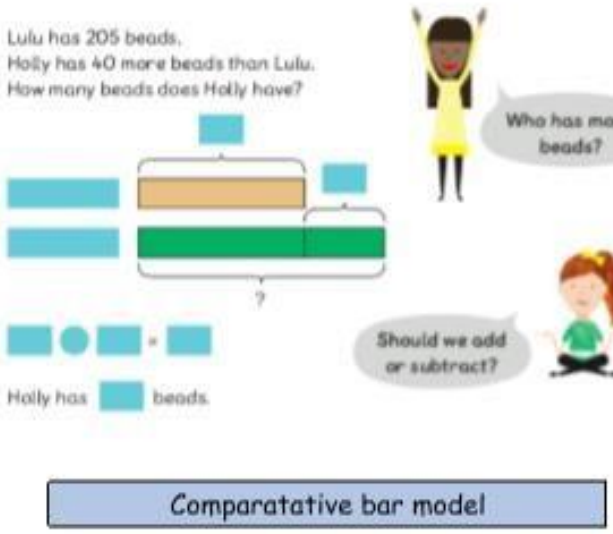


Part-part-whole bar model



Comparing two values

Applying addition and subtraction skills to word problems with bar models to assist



Comparatative bar model

Year 3

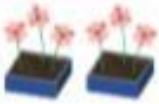
Multiplication

Multiplication

Year 3 3, 4 and 8 times tables

Equal groups

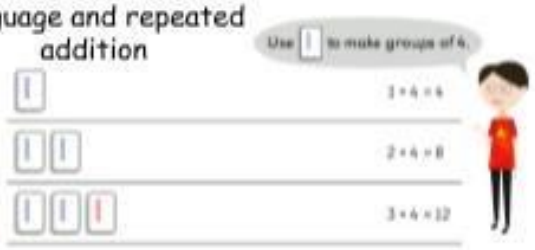
1 group of 3
1 × 3 = 3



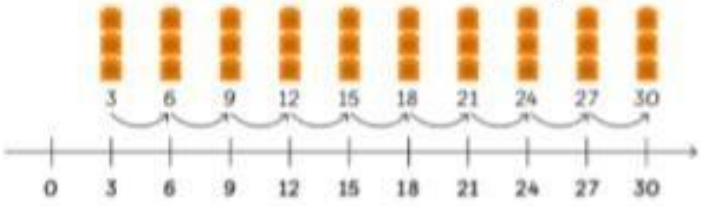
2 groups of 3
2 × 3 = 6

3 groups of 3
3 × 3 = 9

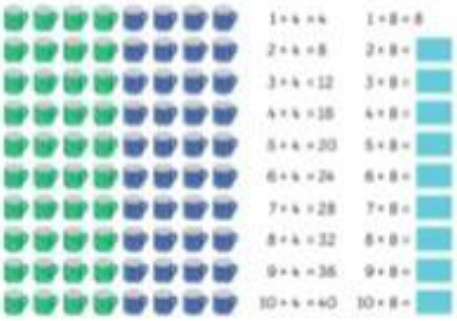
Language and repeated addition



Count in threes. Number lines and hundred squares

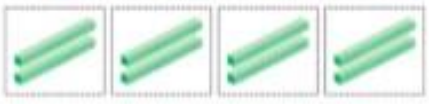


Arrays



1. Using place value

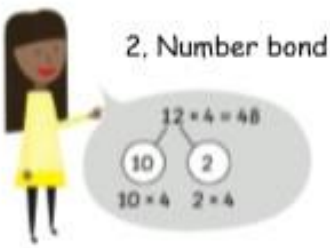
Multiply 2 ones by 4
2 × 4 = 8



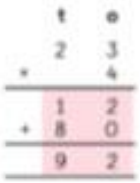
Multiply 2 tens by 4
20 × 4 = 80

There are 80 oranges in the 4 boxes altogether.

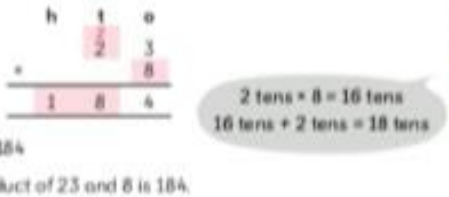
2. Number bond method



3. Bridged column multiplication

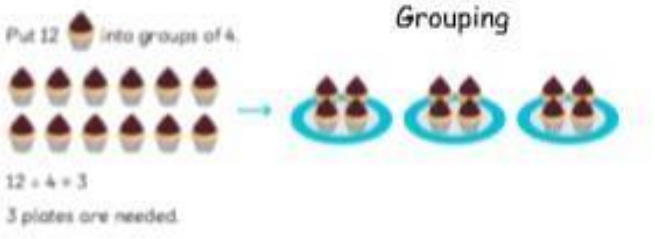


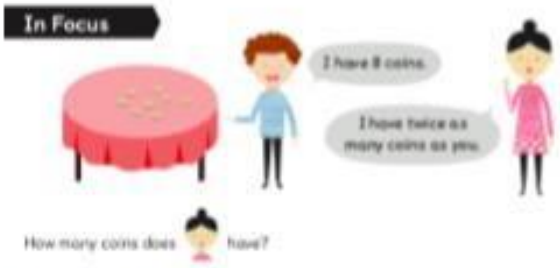
4. Short multiplication

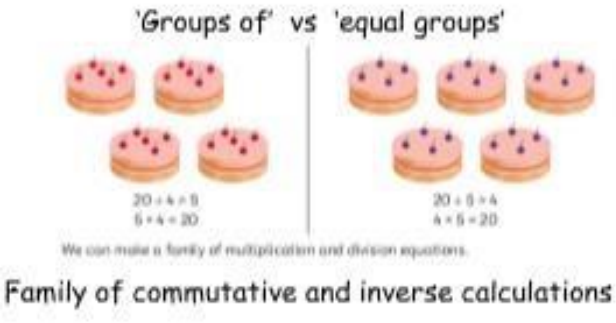


Year 3

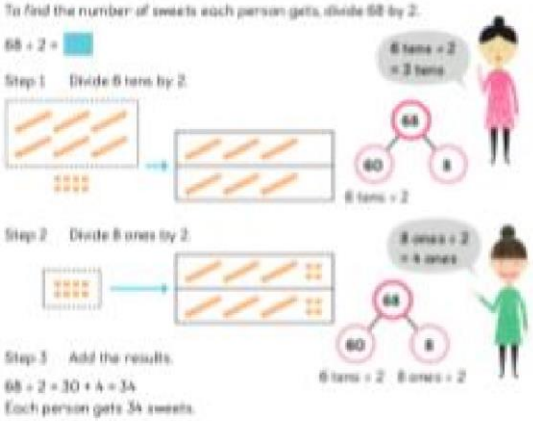
Division

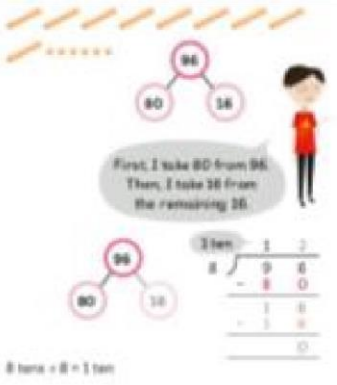


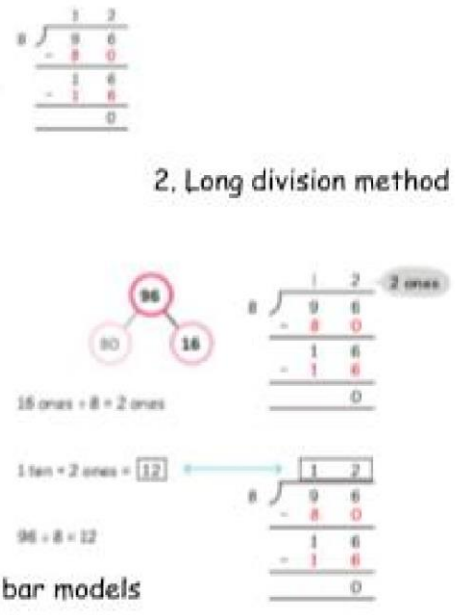




Family of commutative and inverse calculations





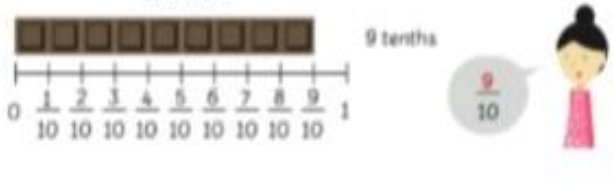


3. Move onto problem solving involving these methods and bar models

Year 3

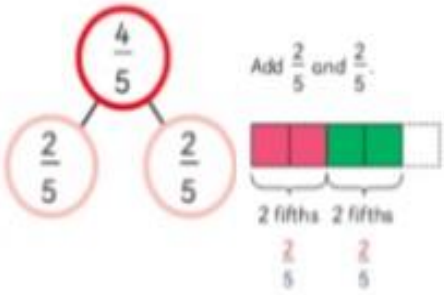
Fractions

Tenths



Finding equivalent and simplifying fractions

Adding fractions



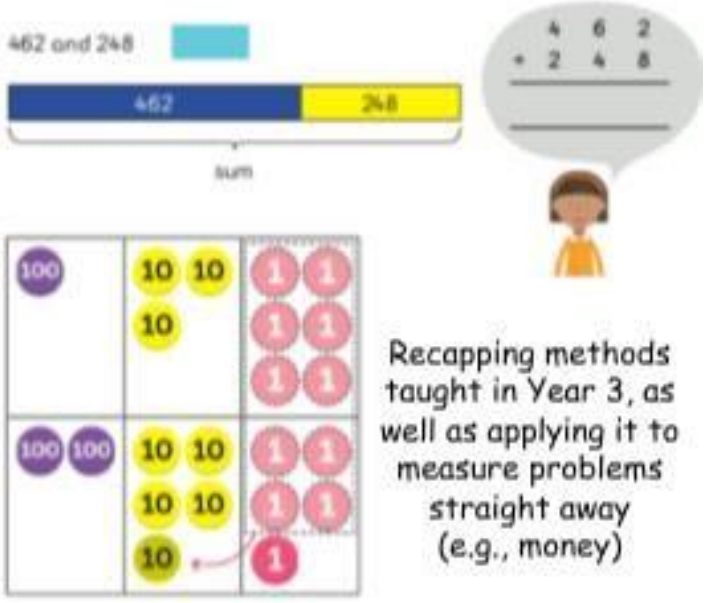
Finding fractions of amounts and sharing more than one

Move onto problem solving involving these methods and bar models

Year 4

Year 4 Calculation Policy

Place Value

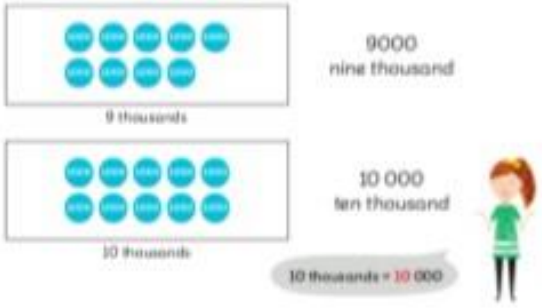


Recapping methods taught in Year 3, as well as applying it to measure problems straight away (e.g., money)

Place value

Year 4

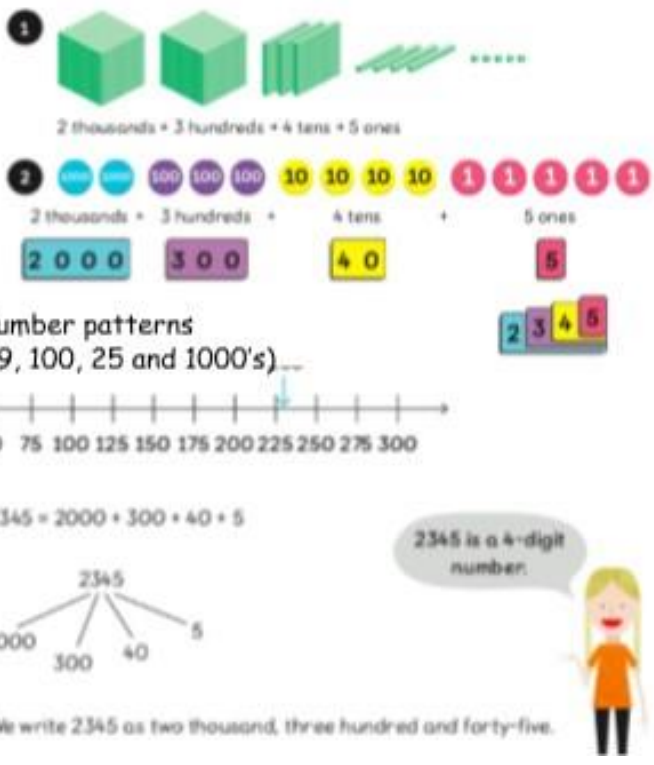
Numbers to 10,000



Use a place-value chart.

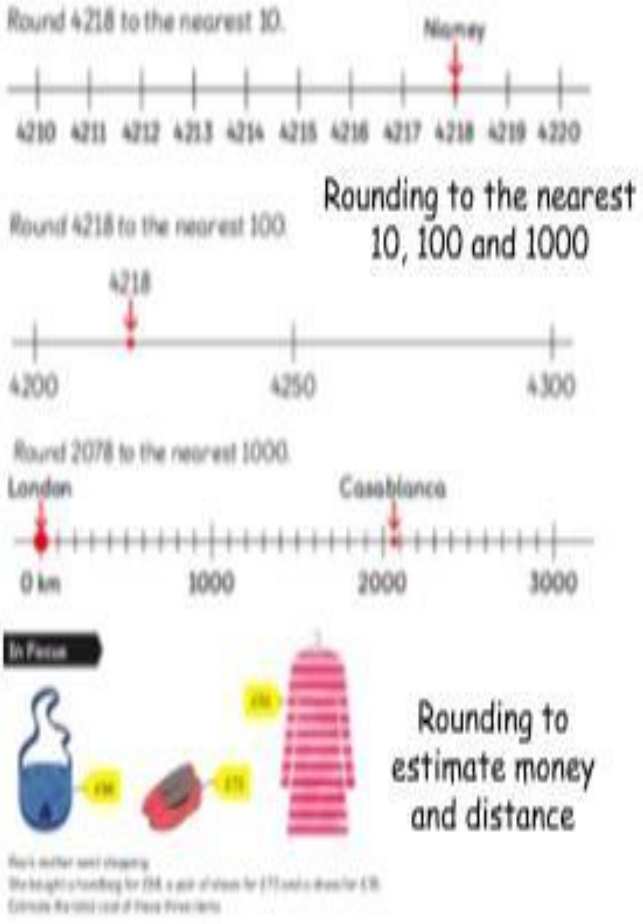
2 thousands + 3 hundreds + 4 tens + 5 ones

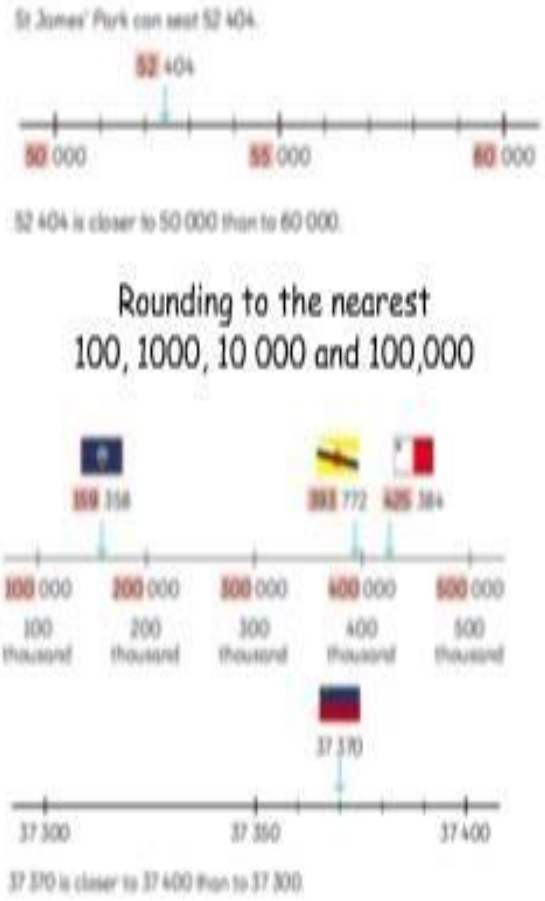
thousands	hundreds	tens	ones
2	3	4	5



Year 4

Place Value





Year 4

Addition

Adding

Year 4

Children are expected to be secure in methods taught in Year 3

Let's estimate.

$$\begin{array}{r} 5\ 7\ 0\ 0 \\ +\ 1\ 2\ 0\ 0 \\ \hline 6\ 9\ 0\ 0 \end{array}$$

Children are expected to estimate answers to check accuracy

Find the sum of 2034 and 9.

2034 + 10 = 2044

2034 + 9 = 2043 (1 less)

Why is the sum 1 less?

Learning mental strategies to add

Find the sum of 98 and 4142 by adding mentally.

98 + 4142 = ☐

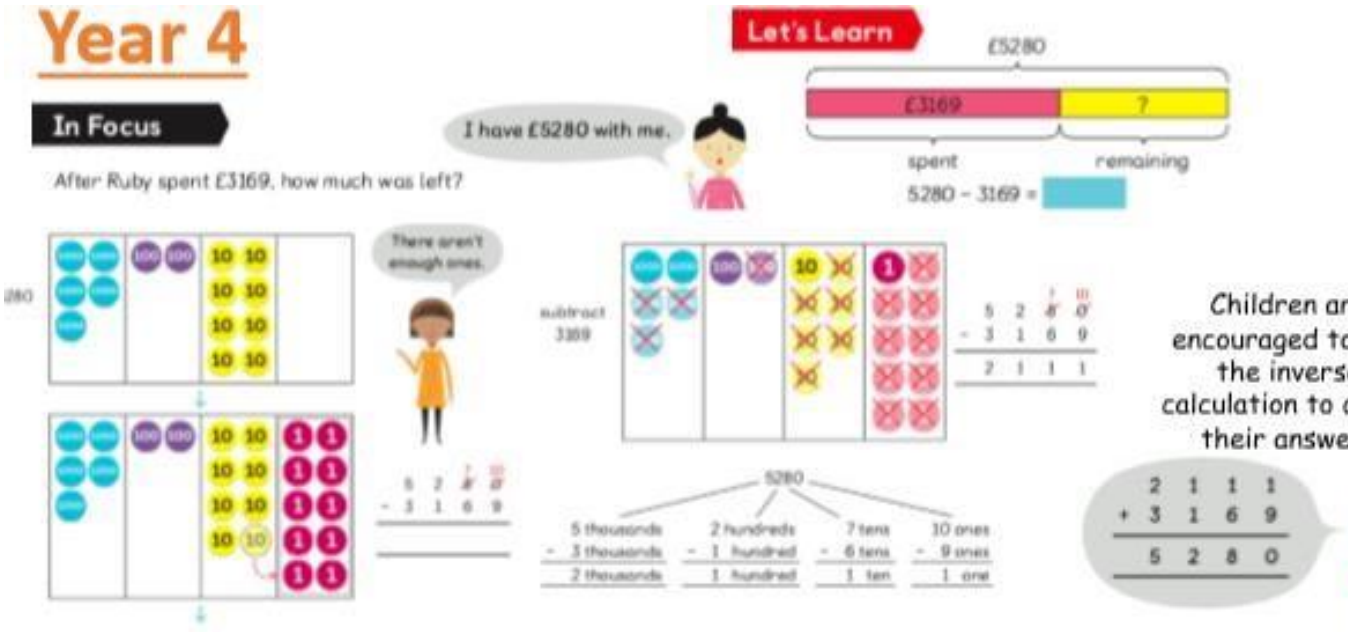
make 100

98 + 4142 = 100 + 4140

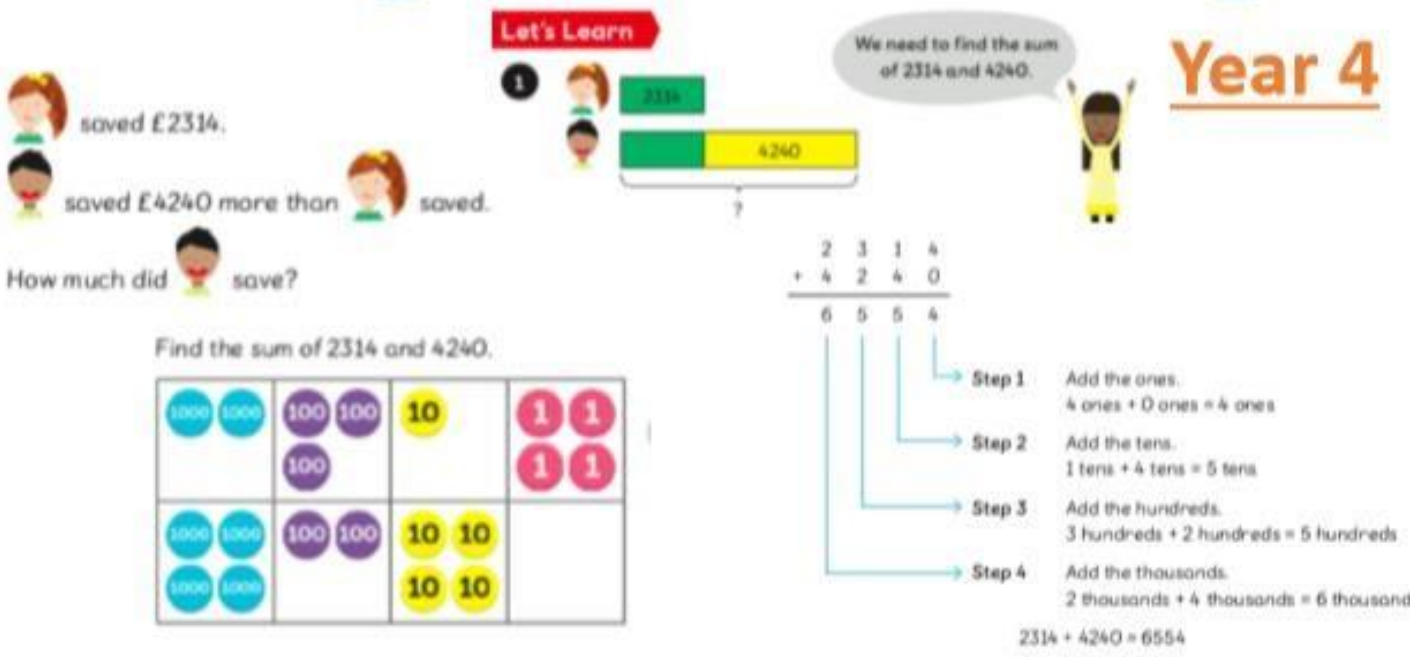
= 4240

Year 4

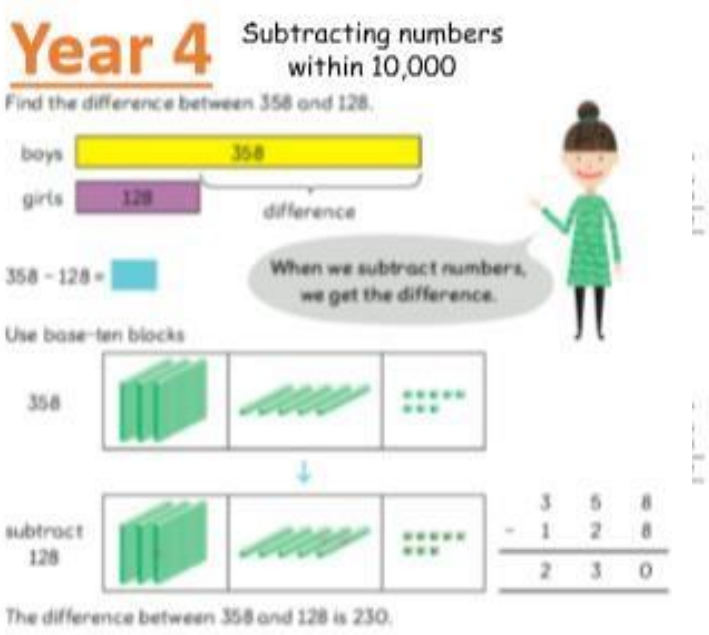
Addition – No renaming

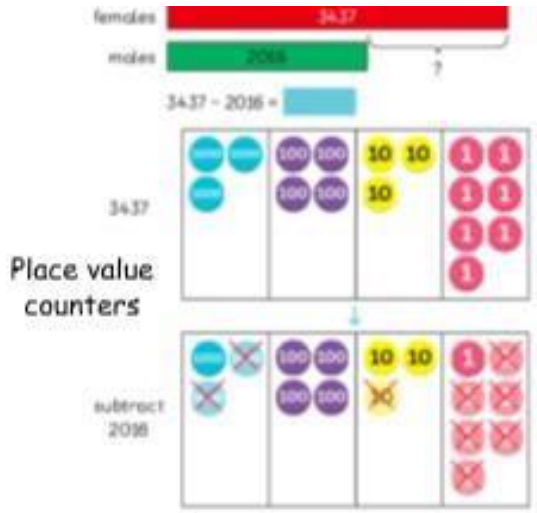


Subtraction – no regrouping



Year 4


Year 4
Subtracting numbers within 10,000
Find the difference between 358 and 128.
boys
358
girls
128
difference
358 − 128 =
When we subtract numbers, we get the difference.
Use base-ten blocks
358
subtract 128
3 5 8
− 1 2 8
2 3 0
The difference between 358 and 128 is 230.


females
3437
males
2098
?
3437 − 2098 =
3437
Place value counters
subtract 2098

Year 4

Subtraction – with regrouping

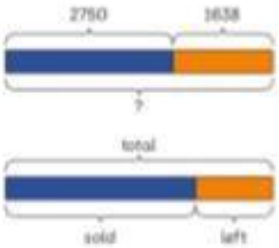
In Focus

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

Understand the problem

Who?	baker
What?	cookies

Make a plan



Complex multi-step word problems

2750 + 1638 = 4388

The baker baked 4388 cookies.

4388 – 3195 = 1193

He had 1193 cookies left.

Column addition and subtraction

Skill of checking

Check

Cookies sold	3195
Cookies left	1193
Cookies baked	4388

3 1 9 5
+ 1 1 9 3
4 3 8 8

Part-part-whole bar model

Bar Model method

In Focus

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

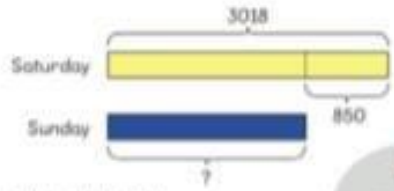
Altogether, how many people attended the funfair over the two days?

Understand the problem

Who?	people
What?	funfair

Make a plan

Carry out the plan



3018 – 850 = 2168

2168 people attended the funfair on Sunday.

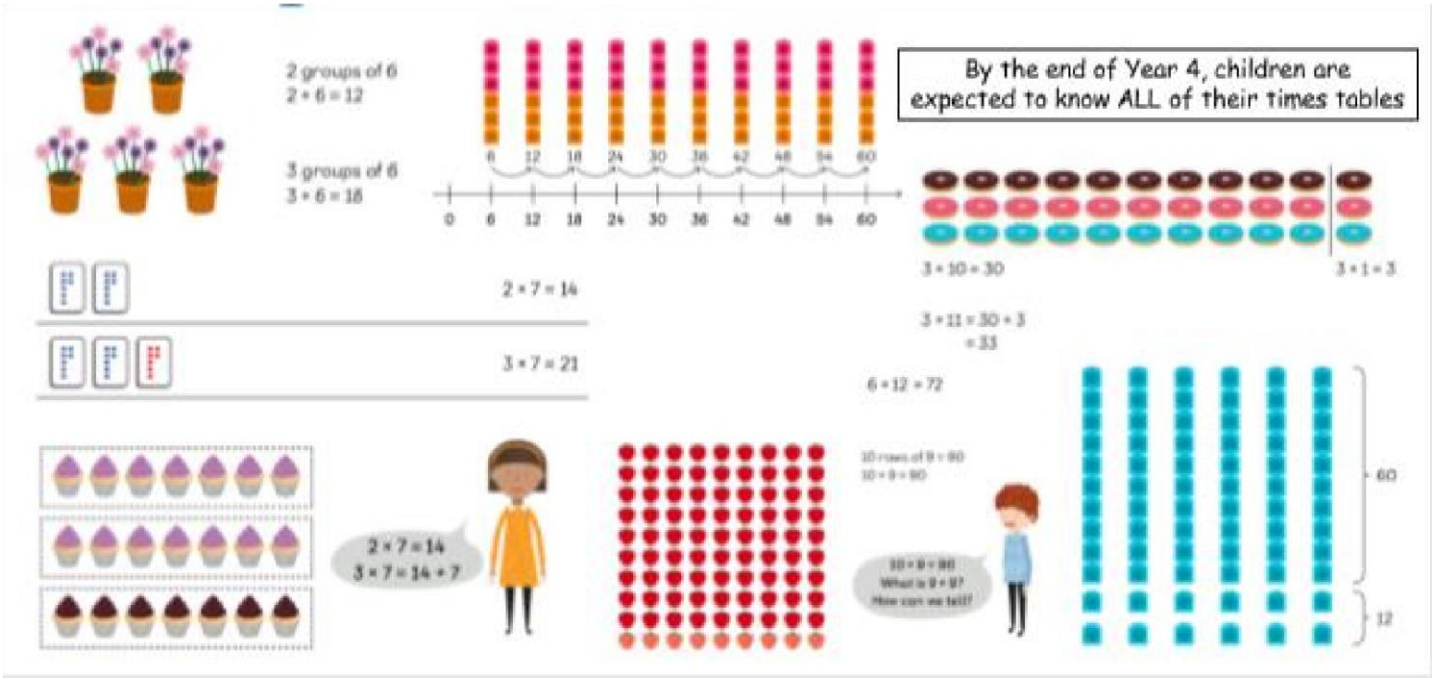
Saturday 3 0 1 8
Sunday + 2 1 6 8
5 1 8 6

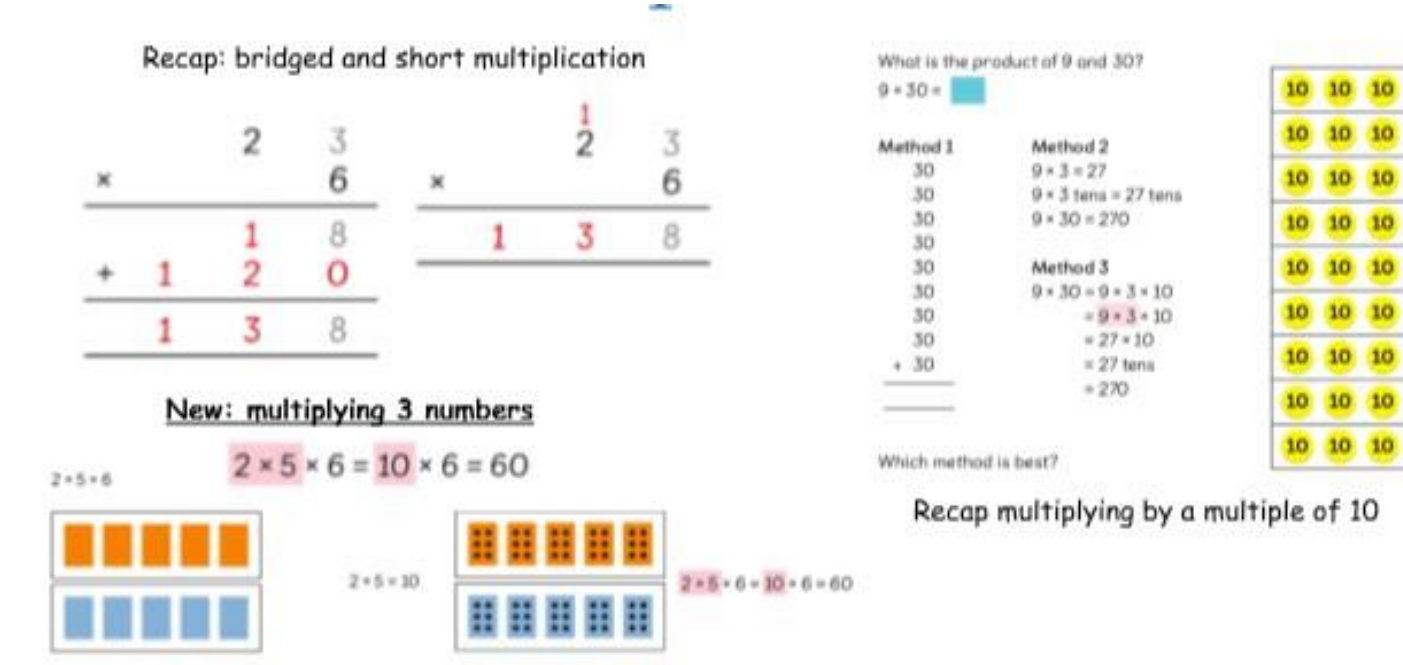
3018 + 2168 = 5186

Comparatative bar model

Year 4

Multiplication





Year 4

Multiplication

Recap:
Bridged and short multiplication

New: multiplying by multiples of 100

7 × 300 = ▭

Method 1

300
300
300
300
300
300
300
+ 300
2100

Method 2

7 × 3 = 21
7 × 3 hundreds = 21 hundreds
7 × 300 = 2100

21 hundreds = 2100

Method 3

7 × 300 = 7 × 3 × 100
= 7 × 3 × 100
= 21 × 100
= 21 hundreds
= 2100

Which method is best?

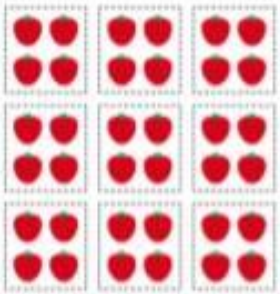
Year 4

Division

36 ÷ 9 = ?

'equal groups' **vs** 'groups of'

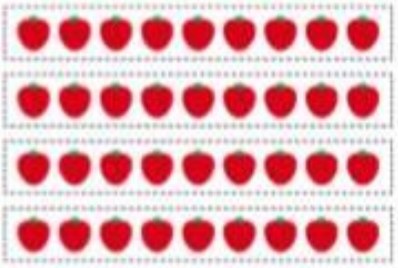
Placing into 9 equal groups



36 ÷ 9 = 4

Each group has 4 strawberries.

Placing in groups of 9



36 ÷ 9 = 4

There are 4 groups.

There were 11 balloons.

11 ÷ 2 = 5 remainder 1

The quotient is 5 and the remainder is 1.
Each friend got 5 balloons.
There was 1 balloon left over.

Children are introduced to the concept of remainders

4 ÷ 4 = ☐

4 ÷ 4 = 1

40 ÷ 4 = ☐

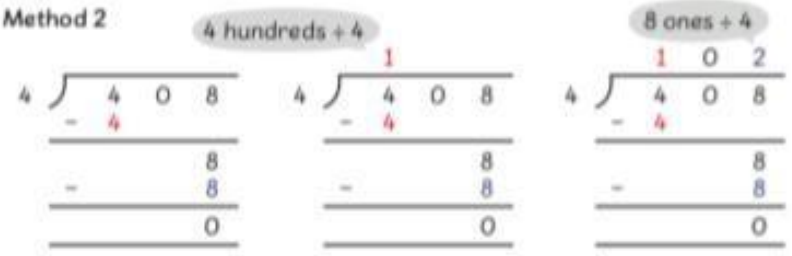
40 ÷ 4 = 10

400 ÷ 4 = ☐

400 ÷ 4 = 100

Method 1

Method 2



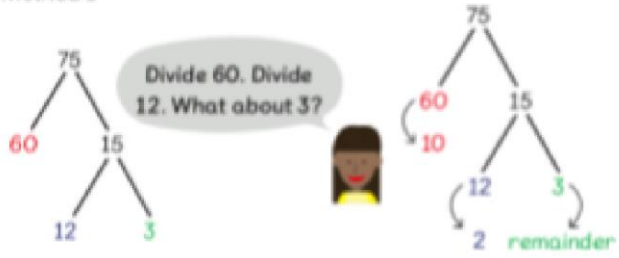
408 ÷ 4 = 102

Year 4

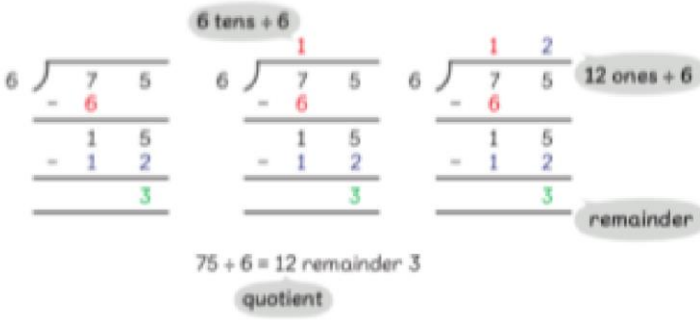
Division

Once confident with the partitioning and long division methods, remainders are introduced using these methods

Method 1



Method 2

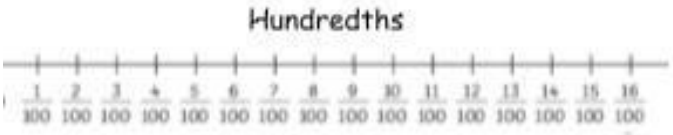


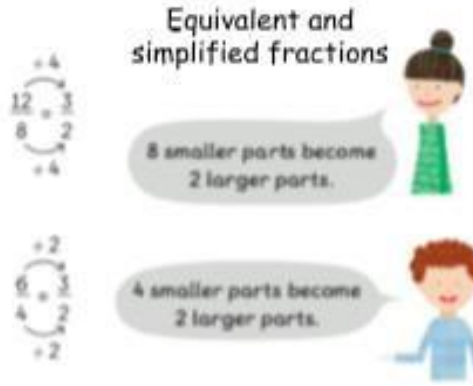
It is not possible to put 75 children into 6 equal groups.

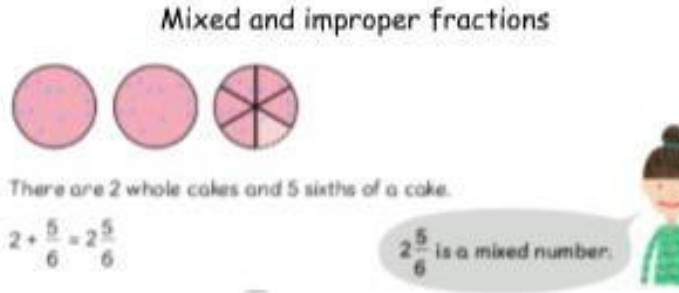
Move onto problem solving involving these methods and bar models

Year 4

Fractions

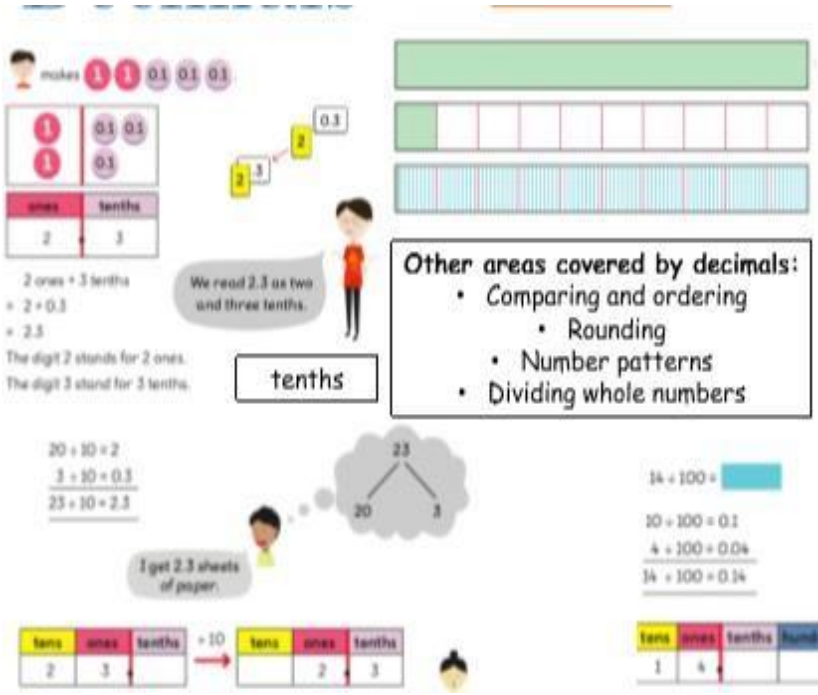






Also: adding and subtracting fractions then finding the simplified form of the answer

Move onto problem solving involving these methods and bar models



YEAR 4 - Multiplication tables check

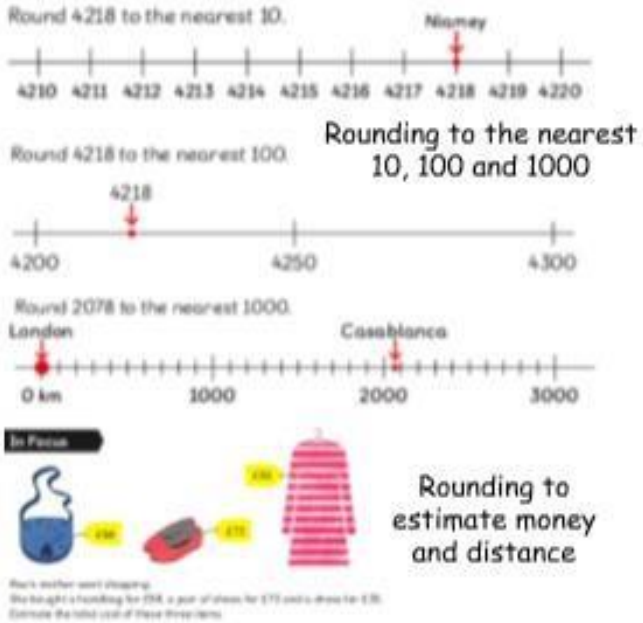
- From the 2019/20 academic year onwards , schools in England will be required to administer an online multiplication tables check (MTC) to year 4 children.
- The national curriculum specifies that children should be taught to recall the multiplication tables up to and including 12 × 12 by the end of year 4.
- The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided

Here at St Mary's, we use Times Table Rockstars to best support the children in the lead up to this. The Sound Check area mirrors the layout in which the MTC will have.

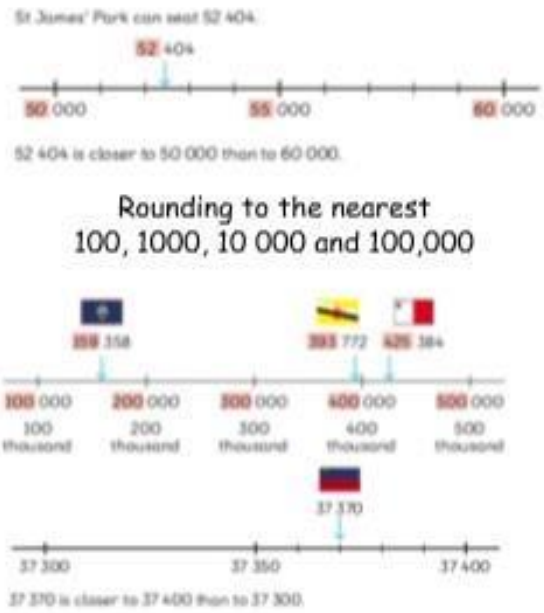
Year 5

Calculation Policy

Year 5



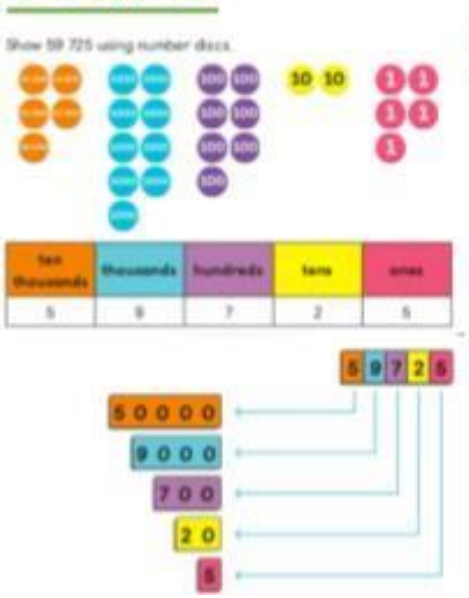
Rounding to the nearest 10, 100 and 1000

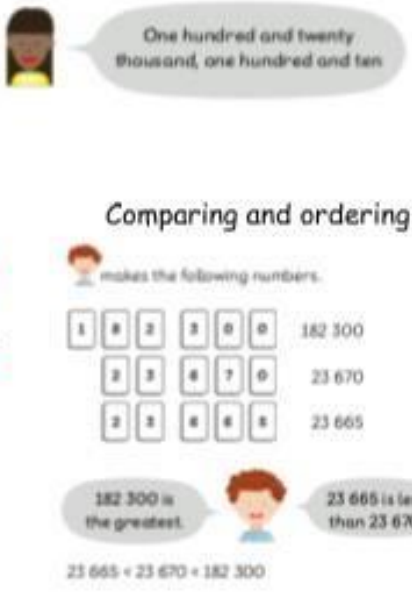


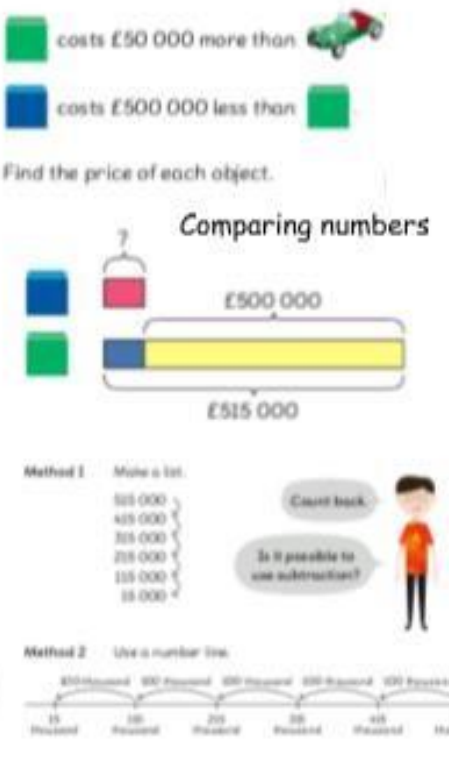
Place value

Year 5

Numbers to 1,000,000



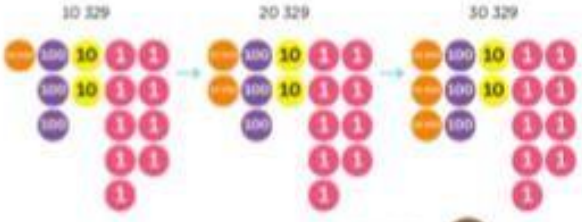




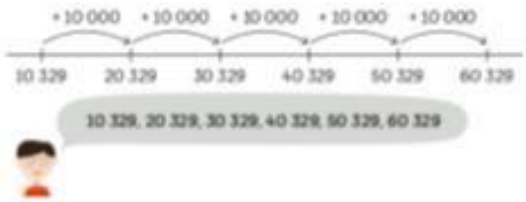
Year 5

Adding

Year 5



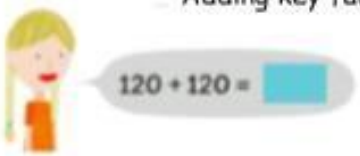
Adding by counting on



Rounding to add by estimate

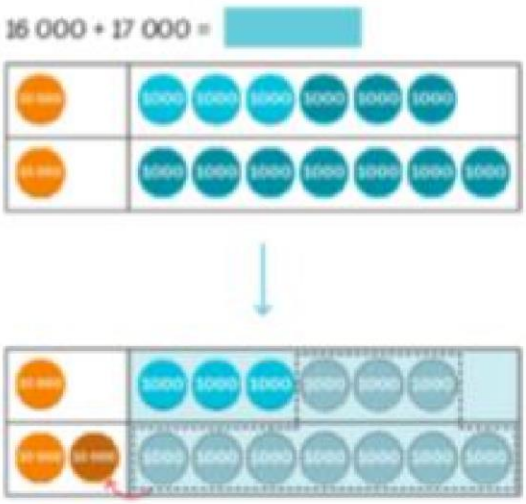
$$\begin{array}{r} 37\ 000 \\ +\ 12\ 000 \\ \hline \\ \hline \end{array}$$

Adding key facts to simplify



$$\begin{array}{r} 120\ 000 \\ +\ 120\ 000 \\ \hline \\ \hline \end{array}$$

Year 5



$$\begin{array}{r} 16\ 000 \\ +\ 17\ 000 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} {\scriptstyle 1}\ \ \\ 16\ 000 \\ +\ 17\ 000 \\ \hline 3\ 000 \\ \hline \end{array}$$

$$\begin{array}{r} {\scriptstyle 1}\ \ \\ 16\ 000 \\ +\ 17\ 000 \\ \hline 33\ 000 \\ \hline \end{array}$$

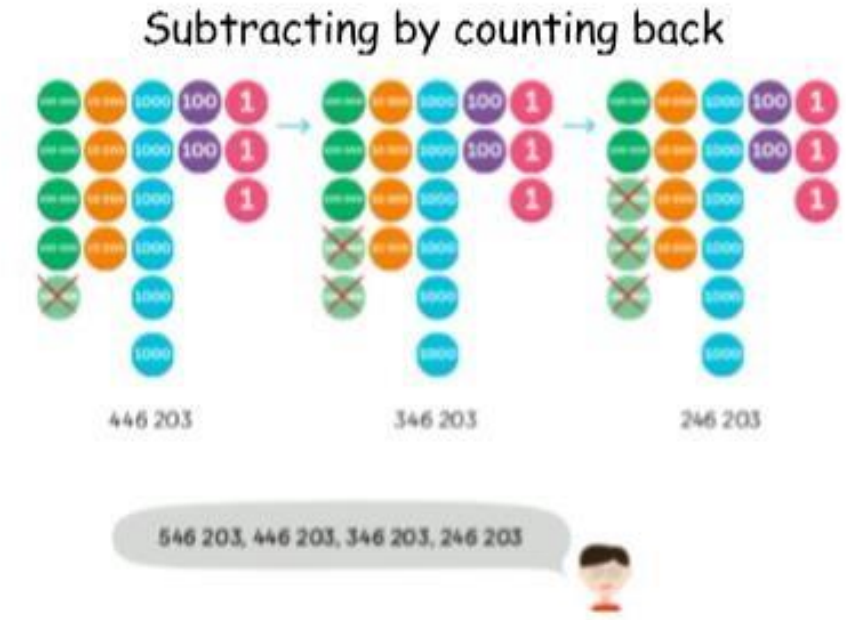
Year 5

Place value counters to visually support column addition

Year 5

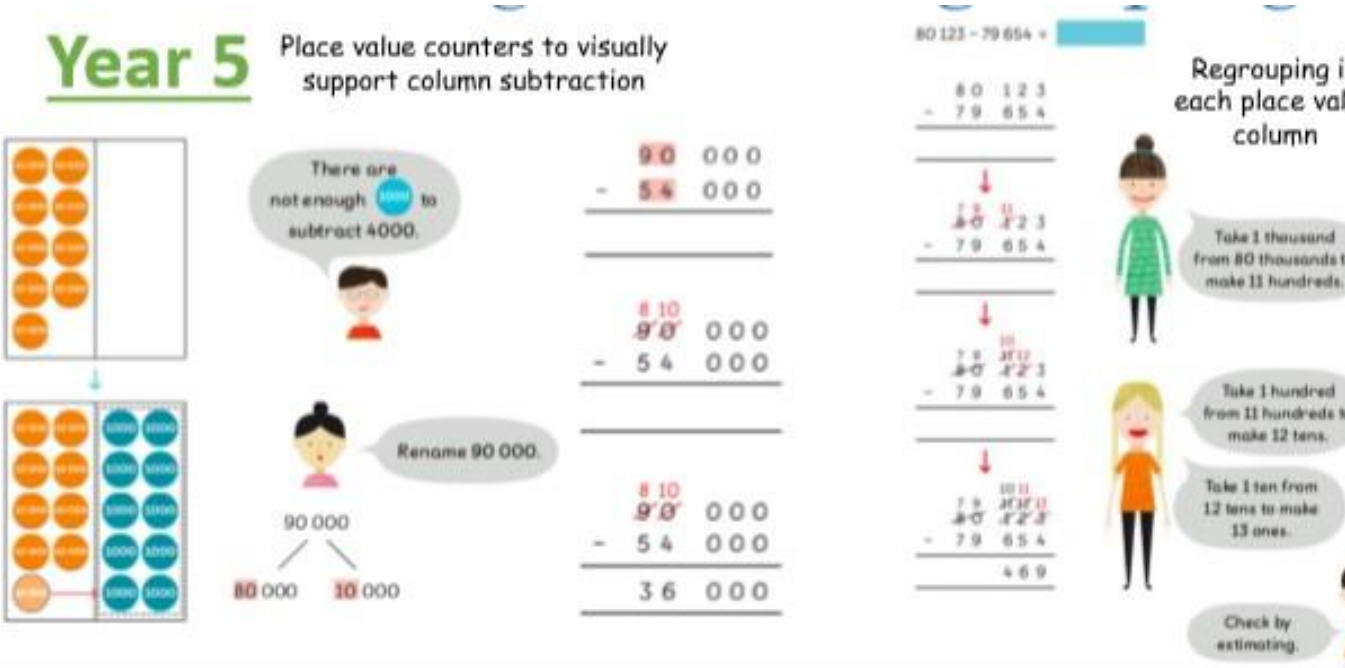
Addition – with renaming

Subtraction



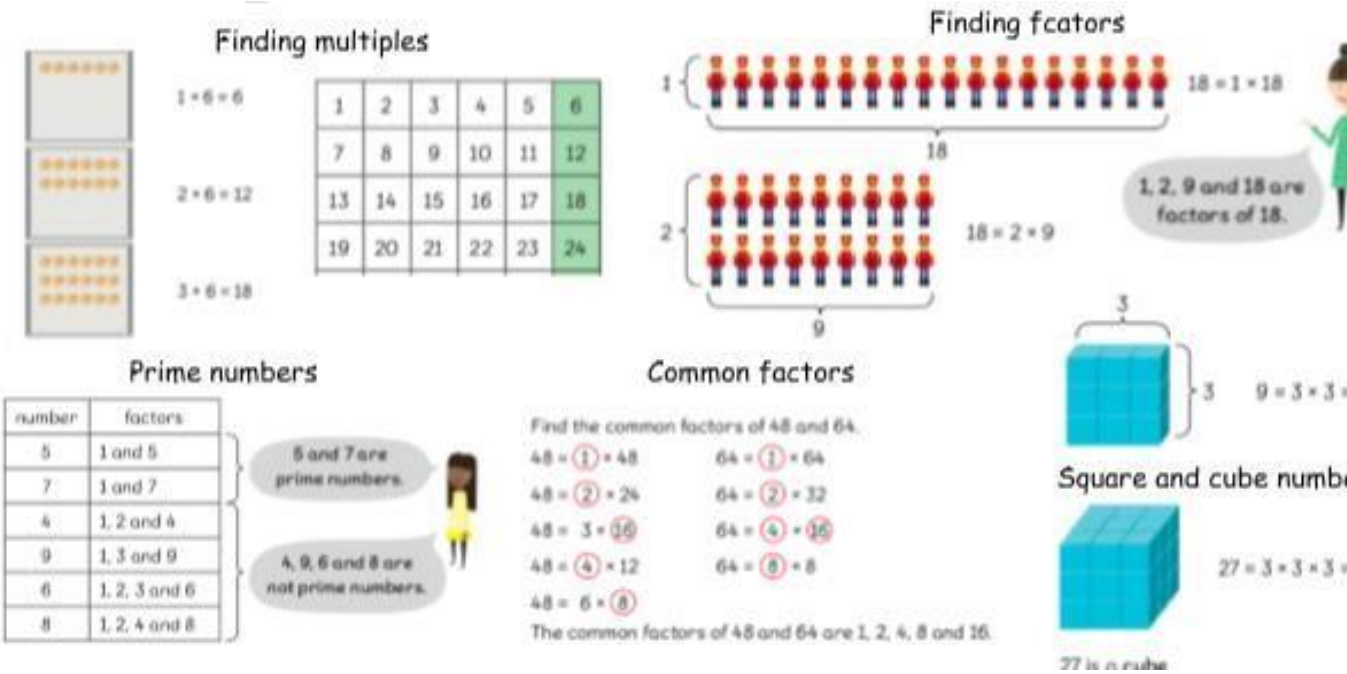
Year 5

Subtraction – with regrouping



Multiplication

Year 5



Multiplication

Year 5

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

$$\begin{array}{r} {\scriptstyle 3}\,{\scriptstyle }\,{\scriptstyle }\,{\scriptstyle } \\ 2\,7\,1\,8 \\ \times \quad\quad 4 \\ \hline 2 \\ \hline \end{array} \qquad \begin{array}{r} {\scriptstyle 3}\,{\scriptstyle }\,{\scriptstyle }\,{\scriptstyle } \\ 2\,7\,1\,8 \\ \times \quad\quad 4 \\ \hline 7\,2 \\ \hline \end{array} \qquad \begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 3}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,7\,1\,8 \\ \times \quad\quad 4 \\ \hline 8\,7\,2 \\ \hline \end{array} \qquad \begin{array}{r} {\scriptstyle 2}\,{\scriptstyle 3}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,7\,1\,8 \\ \times \quad\quad 4 \\ \hline 1\,0\,8\,7\,2 \\ \hline \end{array}$$

Recap:
Bridged and short multiplication but with larger numbers

Place value counters are initially used alongside the column method to support pictorially

$2718 \times 4 = 10\,872$

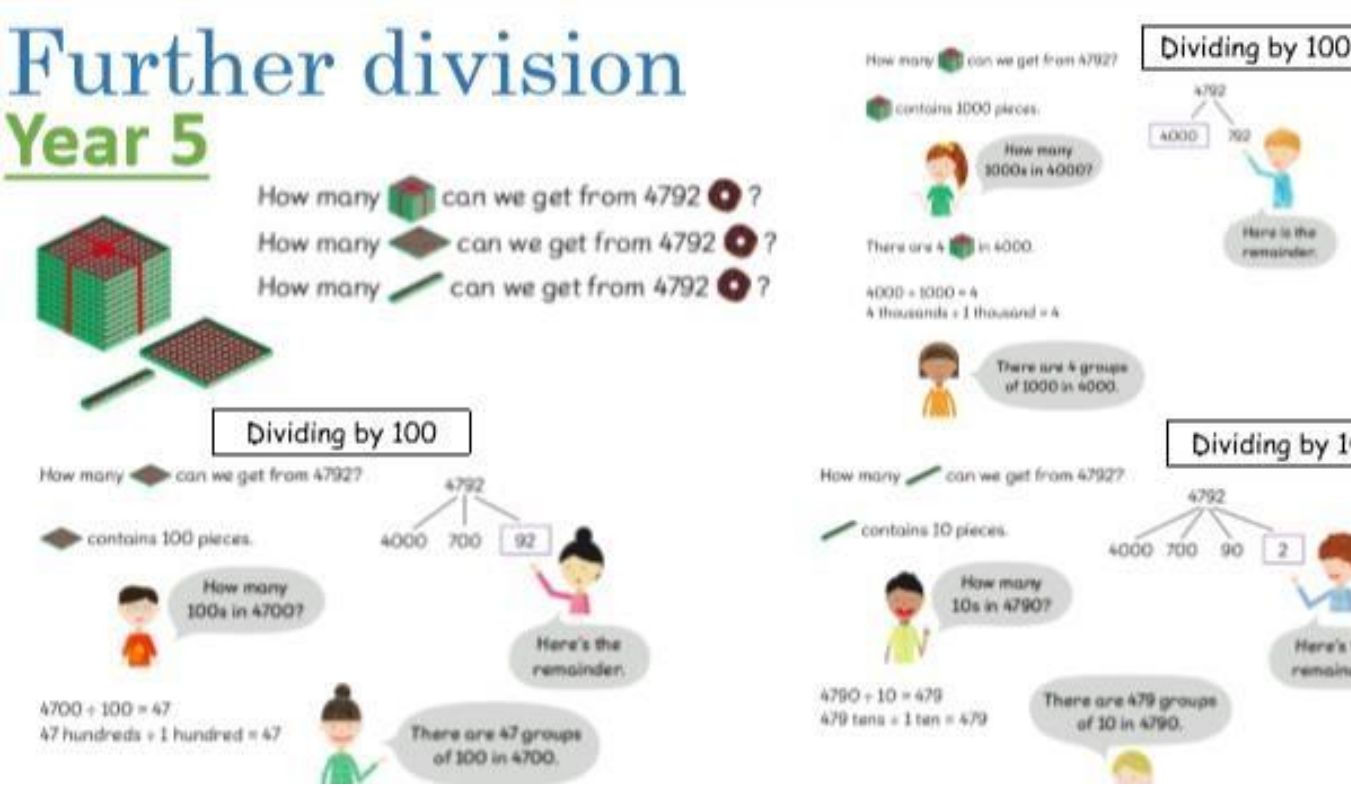
$$\begin{array}{r} {\scriptstyle 1}\,{\scriptstyle }\,{\scriptstyle } \\ {\scriptstyle 4}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,8 \\ \times \quad 2\,6 \\ \hline 1\,6\,8 \longrightarrow 28 \times 6 \\ +\,5\,6 \longrightarrow 28 \times 20 \\ \hline 7\,2\,8 \\ \hline \end{array}$$

New:
Multiplying 2 and 3 digit numbers by 2-digit numbers

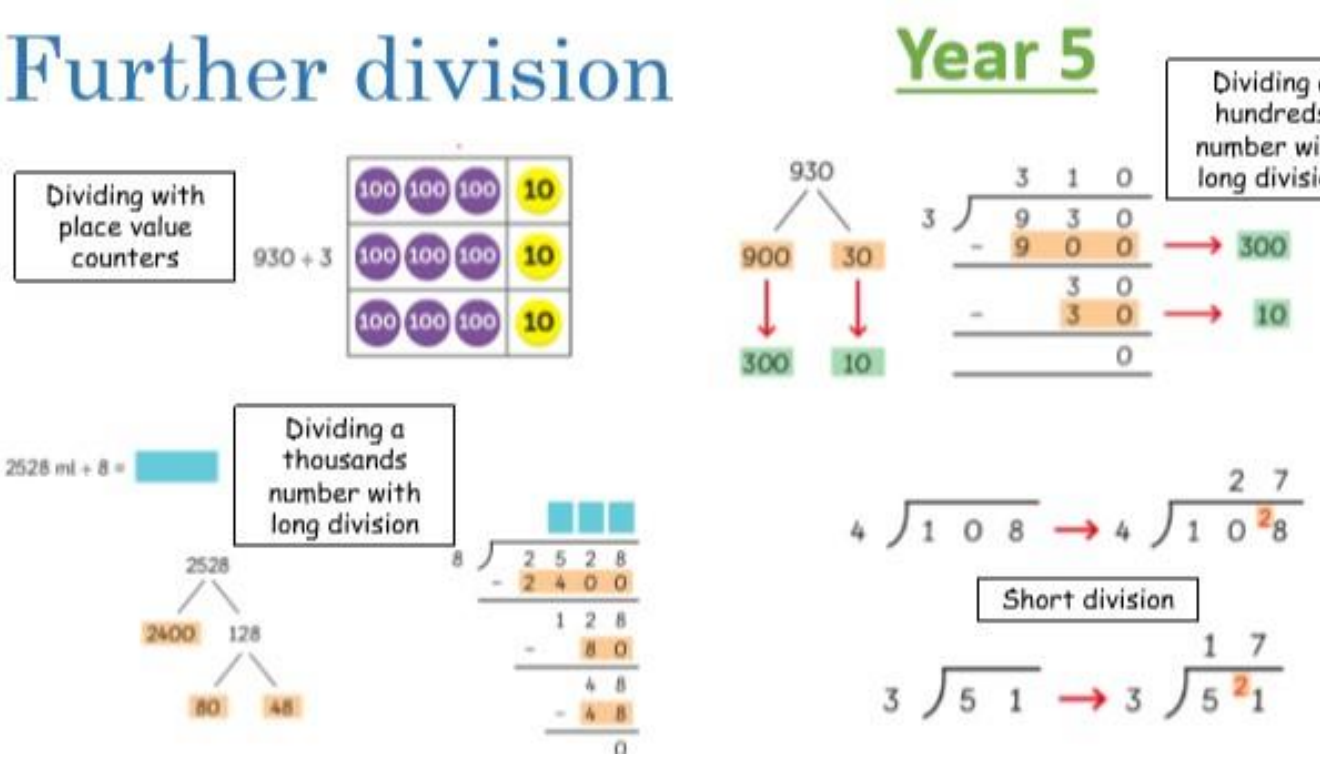
$$\begin{array}{r} {\scriptstyle 4}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,8 \\ \times\,2\,6 \\ \hline 8 \\ \hline \end{array} \longrightarrow \begin{array}{r} {\scriptstyle 4}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,8 \\ \times\,2\,6 \\ \hline 1\,6\,8 \\ \hline \end{array} \longrightarrow \begin{array}{r} {\scriptstyle 1}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,8 \\ \times\,2\,6 \\ \hline 1\,6\,8 \\ 6 \\ \hline \end{array} \longrightarrow \begin{array}{r} {\scriptstyle 1}\,{\scriptstyle }\,{\scriptstyle } \\ 2\,8 \\ \times\,2\,6 \\ \hline 1\,6\,8 \\ 5\,6 \\ \hline \end{array}$$

Division

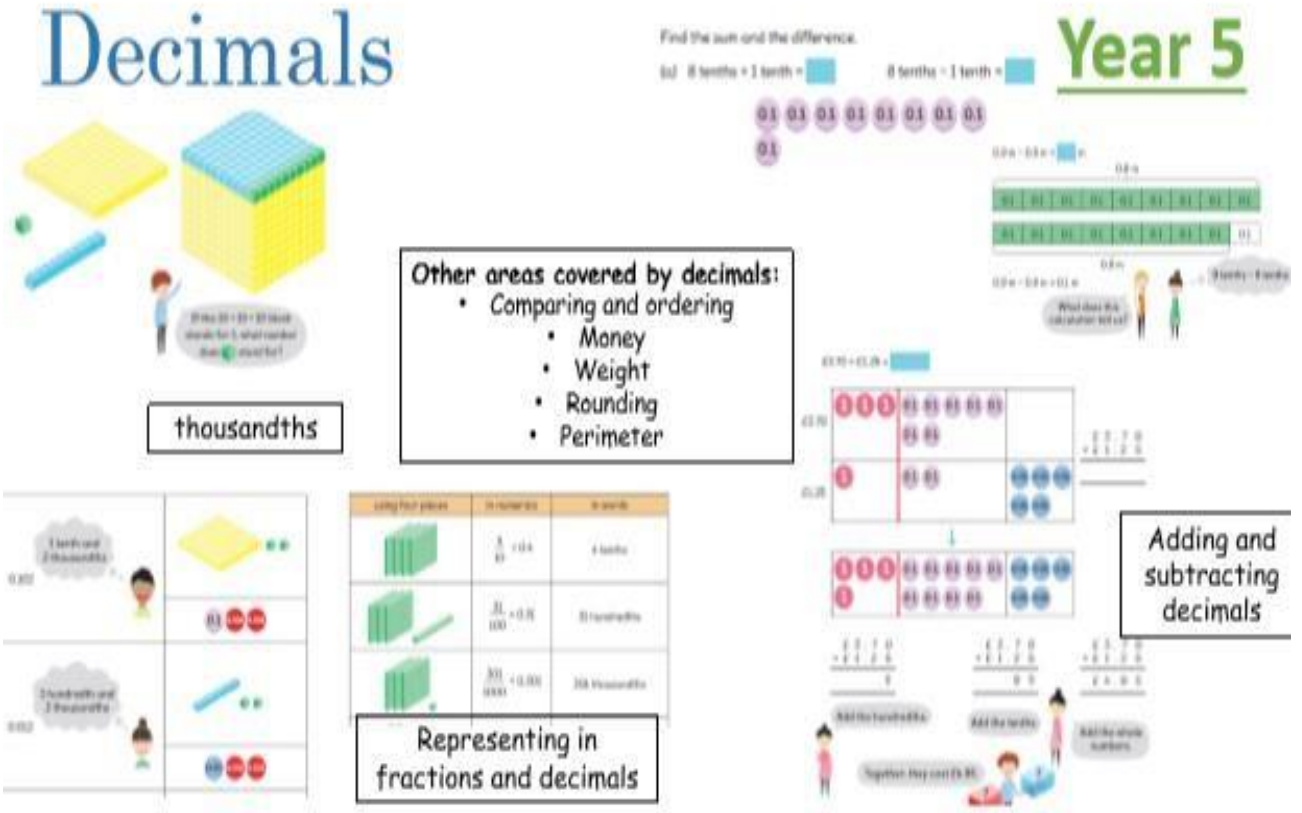
Year 5


Further division
Year 5
How many can we get from 4792 ?
How many can we get from 4792 ?
How many can we get from 4792 ?
Dividing by 100
How many can we get from 4792?
contains 100 pieces.
4792
4000 700 92
How many 100s in 4700?
Here's the remainder.
4700 ÷ 100 = 47
47 hundreds ÷ 1 hundred = 47
There are 47 groups of 100 in 4700.
How many can we get from 4792?
contains 1000 pieces.
How many 1000s in 4000?
There are 4 in 4000.
4000 ÷ 1000 = 4
4 thousands ÷ 1 thousand = 4
There are 4 groups of 1000 in 4000.
Dividing by 100
4792
4000 792
Here is the remainder.
How many can we get from 4792?
contains 10 pieces.
How many 10s in 4790?
4790 ÷ 10 = 479
479 tens ÷ 1 ten = 479
There are 479 groups of 10 in 4790.
Dividing by 1
4792
4000 700 90 2

Year 5


Further division
Year 5
Dividing with place value counters
930 ÷ 3
100 100 100 10
100 100 100 10
100 100 100 10
930
900 30
300 10
3 1 0
3 9 3 0
- 9 0 0 → 300
3 0
- 3 0 → 10
0
Dividing a thousands number with long division
2528 ml ÷ 8 =
2528
2400 128
80 48
8 2 5 2 8
- 2 4 0 0
1 2 8
- 8 0
4 8
- 4 8
0
4 1 0 8 → 4 2 7 1 0 2 8
Short division
3 5 1 → 3 1 7 5 2 1

Year 5


Decimals
Year 5
thousandths
Other areas covered by decimals:
• Comparing and ordering
• Money
• Weight
• Rounding
• Perimeter
Representing in fractions and decimals
Adding and subtracting decimals

Fractions

Year 5

Improper fractions, mixed numbers and simplifying

Sharing objects to write as improper and mixed numbers

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

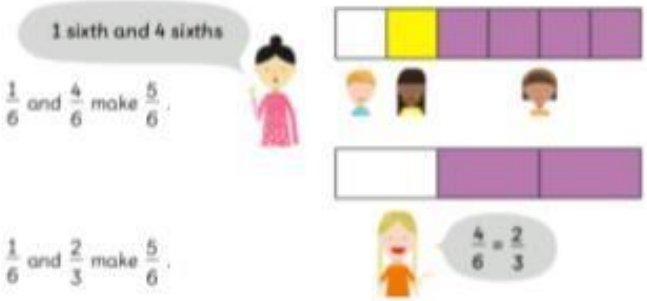
3 apples shared equally among 3 friends.

$3 \div 3 = 1$

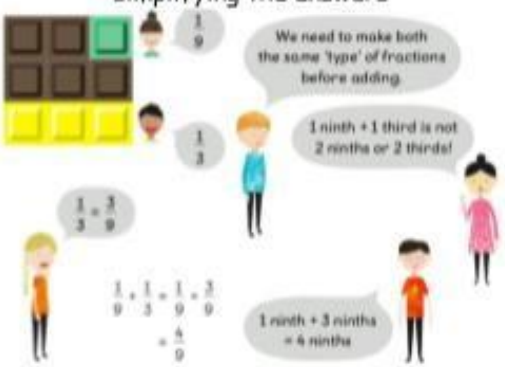
The remaining 2 apples are shared equally among 3 friends

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

Adding fraction pairs before adding fractions with different denominators



Making denominators the same and simplifying the answers



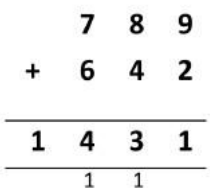
Year 6

Throughout Year 6, a number of resources are used as well as Maths No Problem.
Aim: shaping assured, happy and resilient mathematicians who relish the challenge of maths. They become independent, reflective thinkers, whose skills not only liberate them in maths but also support them across the curriculum.

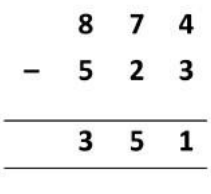
On the lead up to SATs, the children should be encouraged to use formal written methods for all four of the operations.

Addition and Subtraction

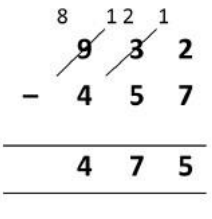
789 + 642 becomes



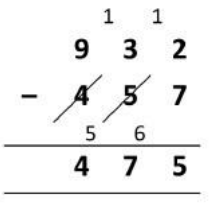
874 – 523 becomes



932 – 457 becomes

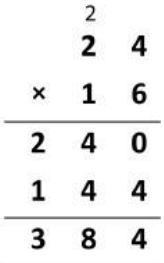


932 – 457 becomes

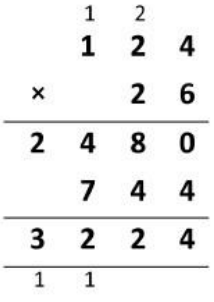


Multiplication

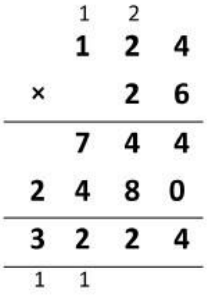
24 × 16 becomes



124 × 26 becomes



124 × 26 becomes



Division

98 ÷ 7 becomes

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

432 ÷ 5 becomes

$$\begin{array}{r} 86\ r2 \\ 5\overline{)432} \end{array}$$

496 ÷ 11 becomes

$$\begin{array}{r} 45\ r1 \\ 11\overline{)496} \end{array}$$

Long Division