



**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**

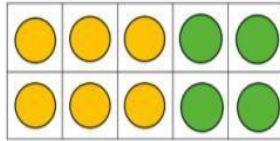
**'We are happy living and learning in God's Friendship'**

# 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.

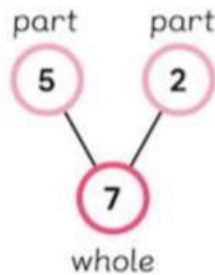


Children will be encouraged to say a number each time they touch an object.

## Using physical resources:

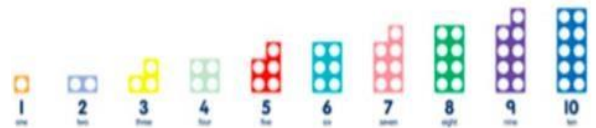


## Part-part-whole model:



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

## Numicon:



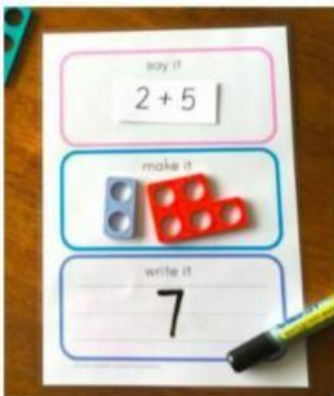
Children will be able to use Numicon to count, as well as ordering them from smallest to biggest to create their own number line. Children should be able to see which Numicon shape is one more or one less.

## Number lines:



Children will be able to use a number line to count, as 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 will 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.



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.

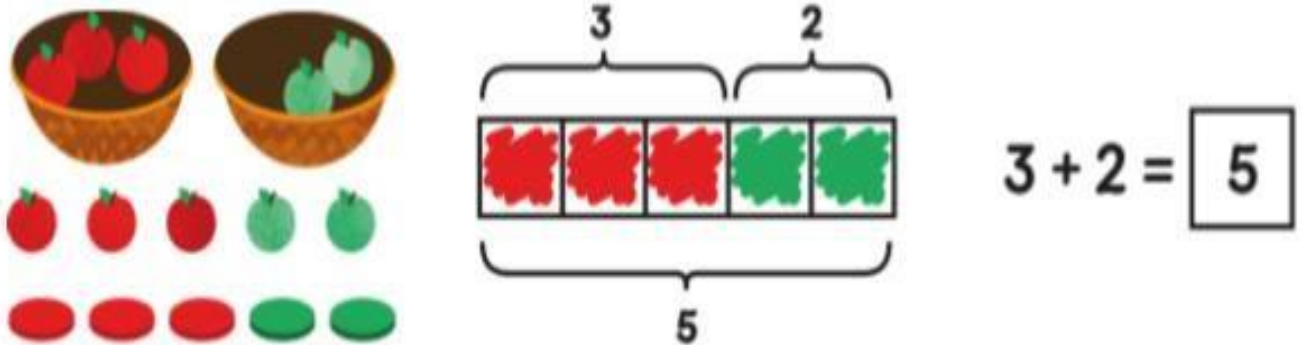
## Problem Solving

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



#### 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

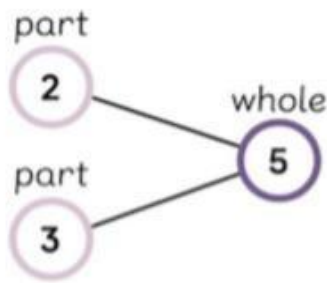
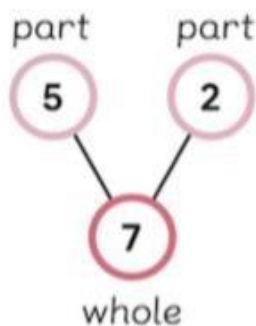
stages of the problem. Children are introduced to the concept at a symbolic level,

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.



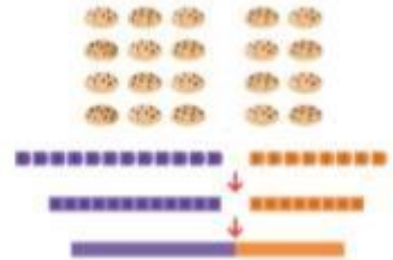
Sam bakes 20 cookies.  
What if he gives some away?



What if Sam gives away 8 cookies?

$$20 - 8 = \square$$

Then, Sam would have    cookies left.

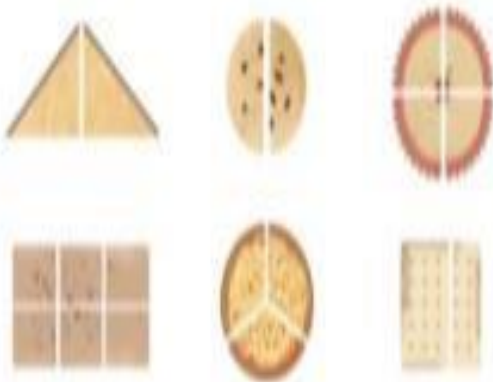


# Fractions

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.

## 1. Finding equal parts

Which are not into equal parts?



between the concrete and the abstract.

## 2. Naming equal parts



The pizza is divided into 3 equal parts.

3 thirds make 1 whole.

## 3. Operations involving fractions



1 litre



$$8 \times \frac{2}{3} = 8 \times 2 \text{ thirds} \\ = 16 \text{ thirds} \\ = \frac{16}{3}$$

$$\frac{16}{3} = 5 \frac{1}{3}$$



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

## 4. Equivalent fractions

What can you say about  $\frac{1}{4}$ ,  $\frac{2}{8}$  and  $\frac{3}{12}$ ?



1 fourth



2 eighths



3 twelfths

## 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.

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

**Worksheet 8**

**Making Number Patterns**

1 Complete the table.

Number	1 more than the number	10 more than the number	100 more than the number
5938			
8999			

Number	1 less than the number	10 less than the number	100 less than the number
4818			
2791			

2 Complete the number patterns.

- (a) 430, 530, , , 830,
- (b) 7560, , , 7590, , 7610

3 Find the missing numbers.

- (a) 1429 is  more than 1419.
- (b) 3299 is 1 less than .
- (c)  is 100 more than 1923.
- (d)  more than 5550 is 5650.
- (e) 10 less than 2903 is .

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

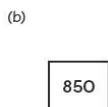
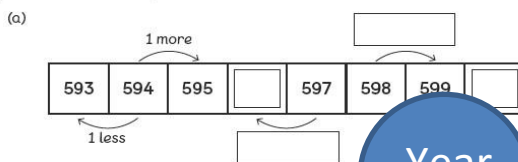
**Worksheet 6**

**Number Patterns**

1 Fill in the blanks.

- (a) 1 more than 99 is . (b) 1 more than 200 is .
- (c) 10 more than 234 is . (d) 10 more than 635 is .
- (e) 1 less than 580 is . (f) 10 less than 580 is .

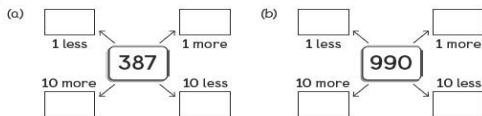
2 Look at each number pattern and fill in the blanks.



3 Complete the number patterns.

- (a) 169, 170, 171, , , 174
- (b) 623, , 621, 620, , 618, 617
- (c) 180, 190, 200, , 220, 230,
- (d) , 400, 401, 402, , 404
- (e) , , 880, 870, 860, 850

4 Fill in the blanks.



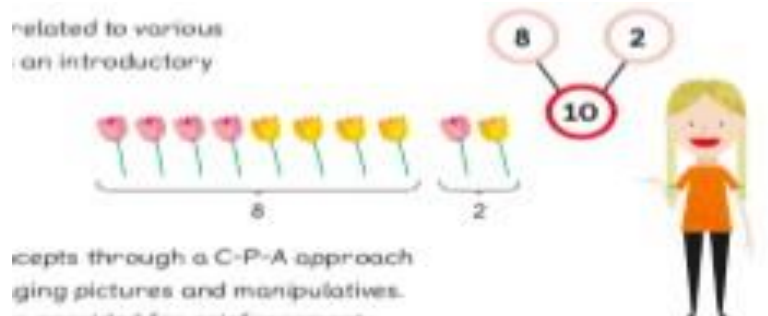
## Structure of lessons

### 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.



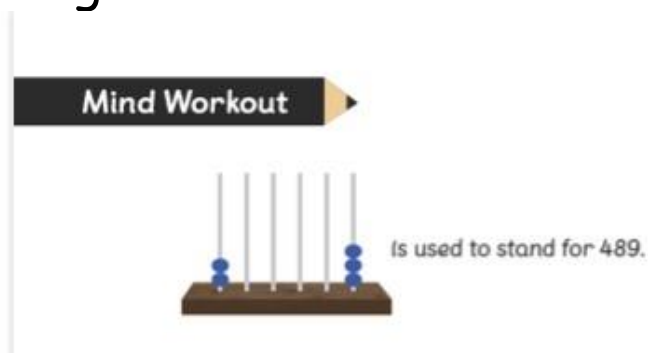
## Guided Practice

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.

Activity  
Time

Work in pairs.

- ① Think of a number more than 10 000 but less than 1 000 000.
- ② Make a number pattern according to a rule. Write down three numbers in the pattern.
- ③ Ask your friend to guess the next two numbers in the pattern.
- ④ Switch roles and repeat ① to ③.

## 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.

in.



I know how to...

solve word problems involving addition or subtraction.

# 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

## Counting to 10:

We can count on....



Count on from 1.

1, 2, 3, 4, 5



We can count back....



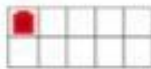
Count back from 10.

10, 9, 8, 7, 6, 5, 4

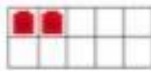


Then we learn about 0.

## Counting with objects:



1



2



3

Physical objects

Tens squares

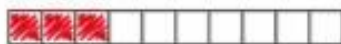
## Counting with objects:



## Counting with number lines:



Three



3, 2, 1, 0

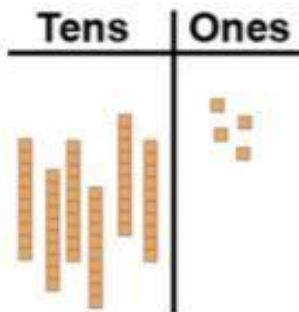
3, 4, 5, 6, 7, 8, 9, 10



Using multilink cubes

# Place Value - Counting

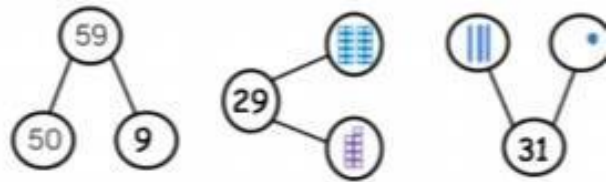
Dienes to represent numbers:



The dienes show 6 tens and 4 ones.

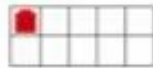
This shows the number 64.

Number bond method:

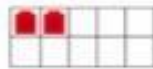


Separating the numbers apart like this is called partitioning.

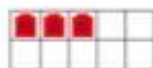
Writing numbers to 10:



1  
one



2  
two



3  
three

Ordering numbers:



5

6

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.

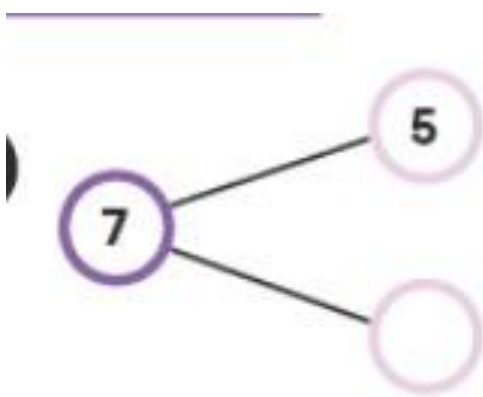


# Year 1

# Addition

## Number line method:

### Abstract calculations:



$$7 = 5 + \square$$

How many eggs are there in total?



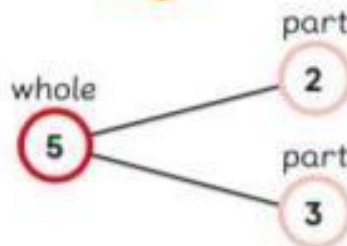
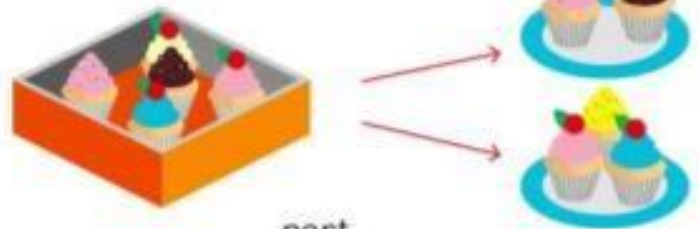
$$2 + 5 = 7$$

(a)   
 $\square + \square = \square$

(b)   
 $\square + \square = \square$

(c)   
 $\square + \square = \square$

Put 5 cupcakes on two plates.



2 and 3  
make 5.

This is a number bond.

## Number bond method:

### Subtraction

#### Pictorial Method:

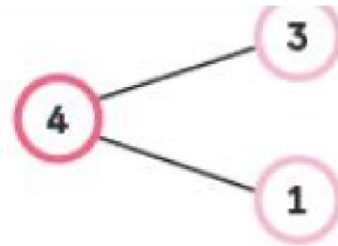
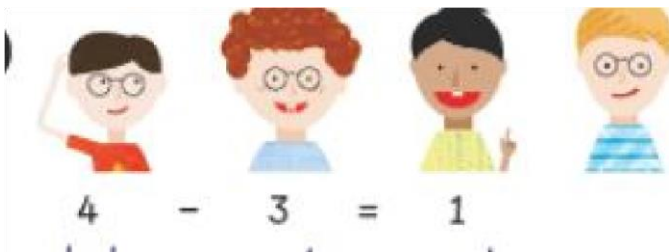
#### Subtract by crossing out:



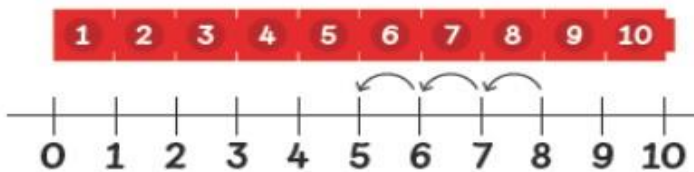
$$7 - 2 = 5$$



#### Subtract by number bonds:



#### Subtract by counting back:



$$8 - 3 = 5$$

There are 5 books in the bag.

#### Subtract by writing stories:

At first, there were 10 carrots in the ground.



Then, the rabbits pulled 7 carrots out.



$$10 - 7 = 3$$

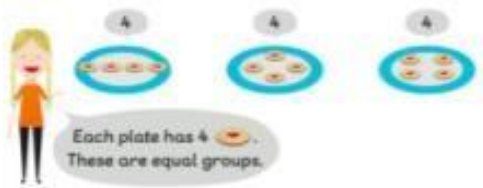
3 carrots remained in the ground.



Year 1

Multiplication and Division

## Making equal groups



## Adding equal groups



There are 4 trays.

Each tray has 5 juice cans.

4 trays of 5 = 20

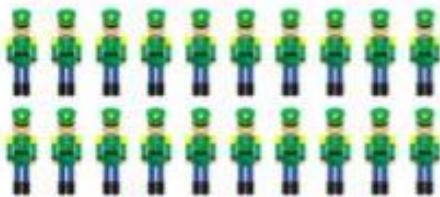
4 groups of 5 = 20

4 fives = 20

5, 10, 15, 20

There are 20 juice cans altogether.

## Making equal rows



10, 20

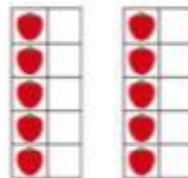
There are 10 toy soldiers in one row.  
2 tens = 20  
There are 20 toy soldiers altogether.

## Making doubles



Double 2 = 4

2 twos



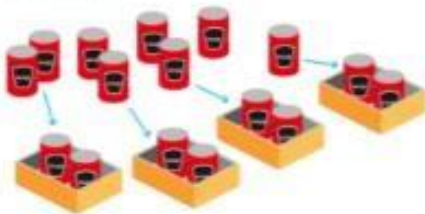
Double 5 = 10

2 fives

# 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.



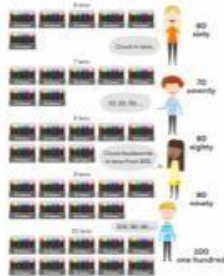
Each child gets 2 cookies.



# Year 2

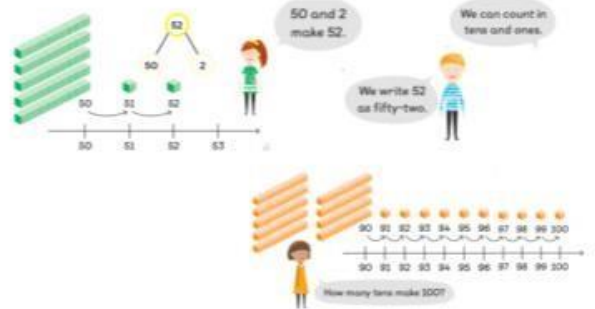
## Counting in tens to 100:

We can count on....



We can count back....

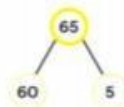
## Counting in tens and ones:



We can represent two-digit numbers in these ways:



tens	ones
6	5



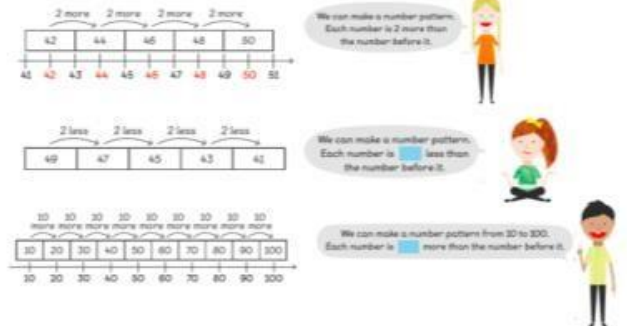
We can make numbers using different number bonds:



Comparing numbers:



We can extend number patterns:



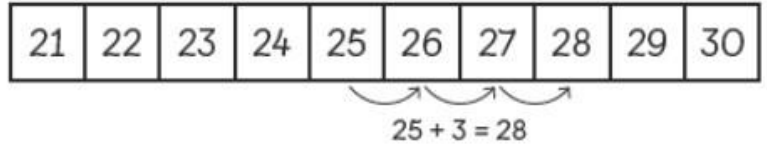
We can find the missing numbers in patterns:



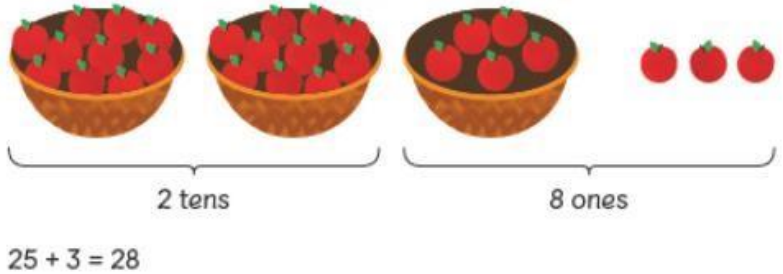
# Year 2

## Addition

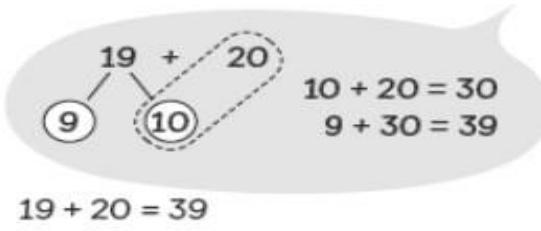
Number line  
method:



Pictorial method:

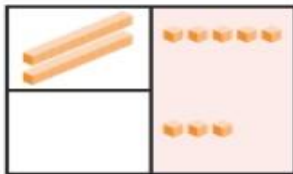


Partitioning method:

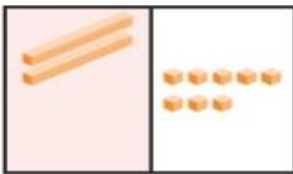


Deines method:

Step 1 Add the ones.  
 $5 \text{ ones} + 3 \text{ ones} = 8 \text{ ones}$



Step 2 Add the tens.



$25 + 3 = 28$

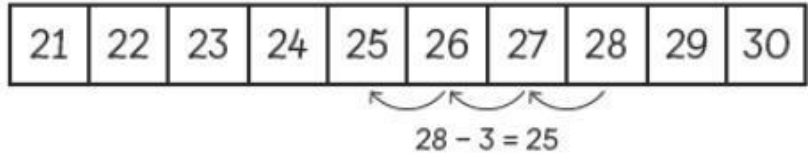
Column method:



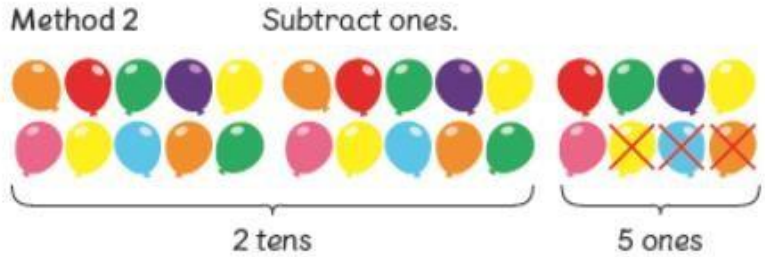
# Year 2

## Subtraction

### Number line method:

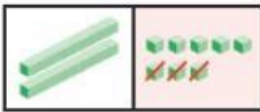


### Pictorial method:



### 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

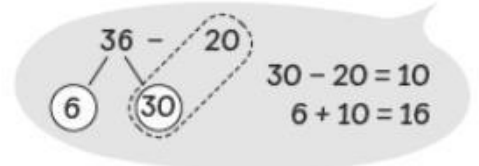
	tens	ones
-	2	8
		3
	2	5

### Partitioning method:

Count back in tens from 36.

$36 - 20 = 16$

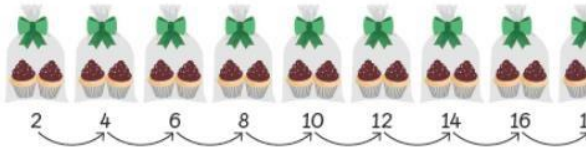
Subtract tens.



$36 - 20 = 16$

# 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

$$3 + 3 + 3 + 3 = 12$$

$$4 \text{ threes} = 12$$

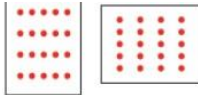
$$4 \text{ groups of } 3 = 12$$

$$4 \times 3 = 12$$

### Grouping method:

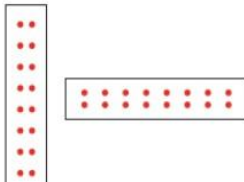
(a)  $4 \times 5 =$

$5 \times 4 =$



(b)  $8 \times 2 =$

$2 \times 8 =$



How many cupcakes are there altogether?

1 stick has 2 sausages.



1 group of 2  
 $1 \times 2 = 2$



2 groups of 2  
 $2 \times 2 = 4$



3 groups of 2  
 $3 \times 2 = 6$

### Abstract Method:

Multiply.

(a)  $2 \times 5 =$

$3 \times 5 =$

(b)  $4 \times 5 =$

$5 \times 5 =$

# 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.



$$\begin{array}{l} 2 \times 10 = 20 \\ 10 \times 2 = 20 \end{array} \quad \begin{array}{l} 20 \div 2 = 10 \\ 20 \div 10 = 2 \end{array}$$

## 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 .

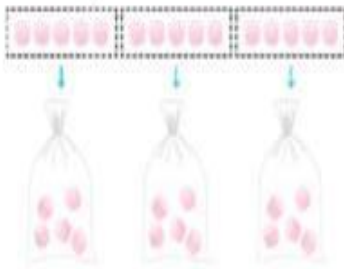
Use  for each bag.



## 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.

$$15 \div 5 = 3$$

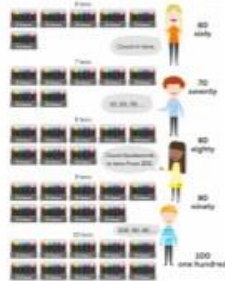
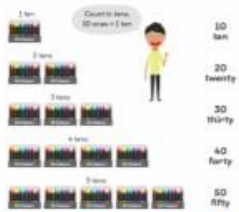
Ruby needs **3** bags.



# Year 3

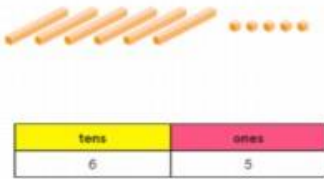
## Counting in tens to 100:

We can count on....

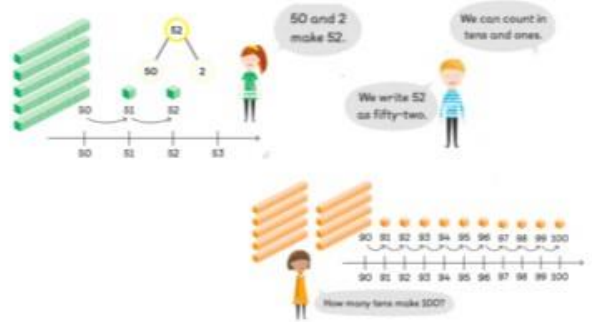


We can count back....

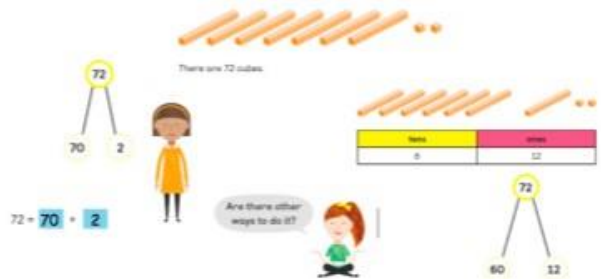
We can represent two-digit numbers in these ways:



## Counting in tens and ones:



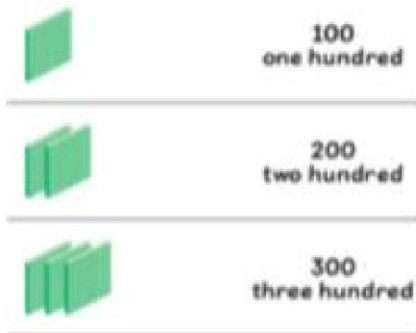
We can make numbers using different number bonds:



# Place value

## Year 3

Numbers to 1000



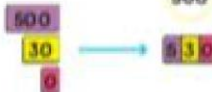
What is the value of each digit in 530?

hundreds	tens	ones
5	3	0

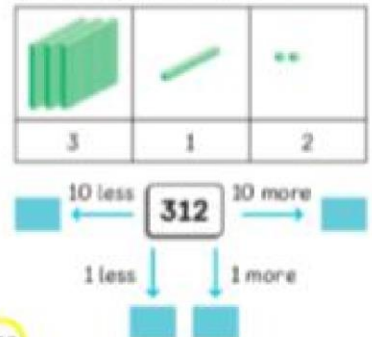
530 =  hundreds +  tens +  ones

530 =  +  +

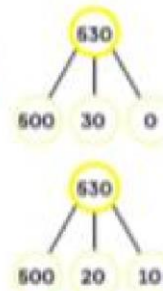
The value of the digit 5 is 500.  
The value of the digit 3 is 30.  
The value of the digit 0 is 0.



Fill in the missing numbers.



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?

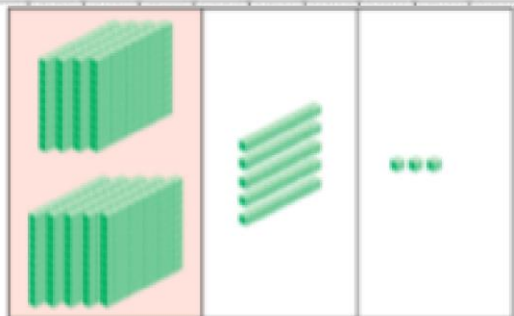
We can write a family of addition and subtraction facts.

$$6 + 12 = 18$$

$$18 - 12 = 6$$

$$12 + 6 = 18$$

$$18 - 6 = 12$$

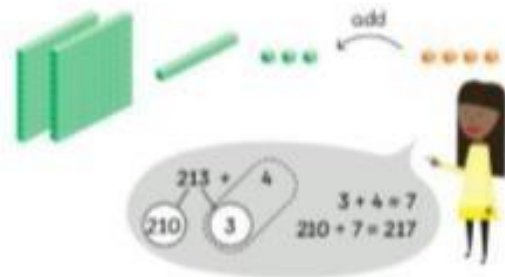


	h	t	o
+	4	3	2
5	2	1	
9	5	3	

$$432 + 521 = 953$$

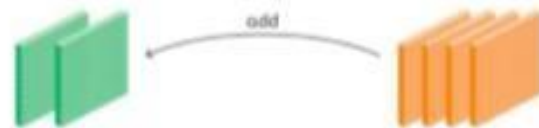
Beginning practically with dienes before moving onto column addition  
 Number bond method is taught alongside both methods

Adding ones, tens and hundreds



$$213 + 4 = 217$$

There were 217 books in the bookcase.






# Year 3


## Addition - with renaming

Year 3


Expected to solve a larger number of abstract calculations

1 (a)  $153 + 2 =$    
(b)  $153 + 20 =$    
(c)  $153 + 200 =$  

2 (a)  $214 + 3 =$    
(b)  $214 + 30 =$    
(c)  $214 + 300 =$  

3 (a)  $325 + 16 =$    

	h	t	u
	3	2	5
+		1	6
<hr/>			
<hr/>			



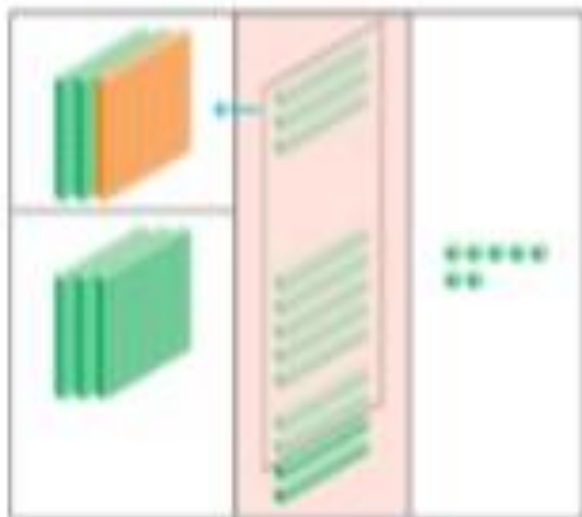
(b)  $256 + 543 =$    

	h	t	u
	2	5	6
+	5	4	3
<hr/>			
<hr/>			



Add the tens.  
 $3 \text{ tens} + 9 \text{ tens} = 12 \text{ tens}$   
Regroup the tens.  
 $12 \text{ tens} = 1 \text{ hundred} + 2 \text{ tens}$

Secure understanding of place value to 1000



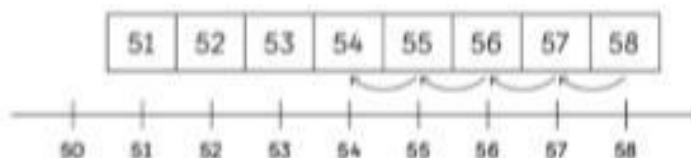
	h	t	u
	3	2	5
+		1	6
<hr/>			
		3	1
<hr/>			
		2	7
<hr/>			

# Year 3 Subtraction

## Year 3

Subtracting numbers  
within 1000

Method 1 Count back from 58.



Method 2 Subtract ones.



$$58 - 4 = 54$$

Sam had 54 cookies left.



Recapping methods taught in Year 1 and 2

# Year 3 Subtraction - no regrouping

## Year 3

Subtract the ones.  
 $1000 - 3 \text{ ones} = 2 \text{ ones}$



$$\begin{array}{r} \text{H} & \text{t} & \text{o} \\ 10 & 0 & 0 \\ - & 0 & 3 \\ \hline & & 2 \end{array}$$

Subtract the tens.  
 $7 \text{ tens} - 2 \text{ tens} = 5 \text{ tens}$



$$\begin{array}{r} \text{H} & \text{t} & \text{o} \\ 70 & 0 & 0 \\ - & 20 & 0 \\ \hline 50 & 0 & 0 \end{array}$$

Subtract the hundreds.  
 $9 \text{ hundreds} - 7 \text{ hundreds} = 2 \text{ hundreds}$



$$\begin{array}{r} \text{H} & \text{t} & \text{o} \\ 90 & 0 & 0 \\ - & 70 & 0 \\ \hline 20 & 0 & 0 \end{array}$$

$900 - 700 = 200$

There is now 200 beads left in the jar.

Beginning practically with dienes before moving onto column subtraction  
 Number bond method is taught alongside both methods

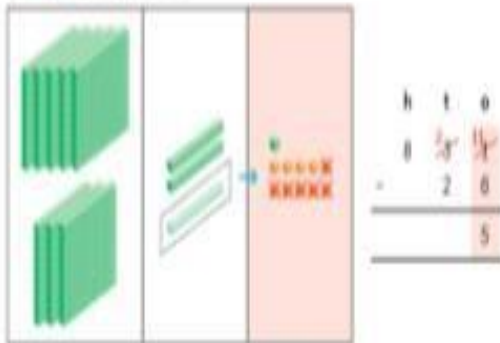
# Year 3

## Subtraction - with regrouping

Year 3

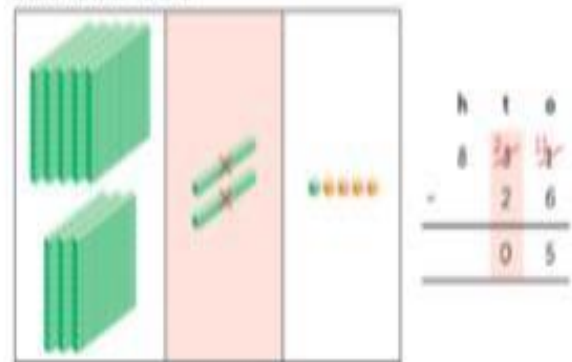
Step 1 Regroup 1 ten into 10 ones.  
Subtract the ones.

$$11 \text{ ones} - 6 \text{ ones} = 5 \text{ ones}$$



Step 2 Subtract the tens.

$$2 \text{ tens} - 2 \text{ tens} = 0 \text{ tens}$$



Step 3 Subtract the hundreds.



Beginning practically with dienes before moving onto column subtraction

Number bond method is taught alongside both methods



# Year 3

## Bar Model methods

Concrete

Pictorial

Abstract

I have 5 pencils.

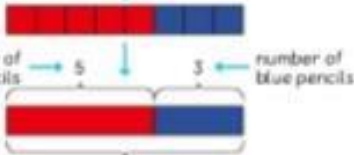


I have 3 pencils.



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

Use to show the number of pencils.



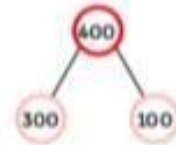
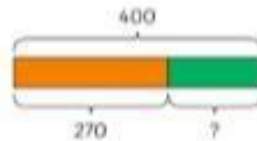
$5 + 3 = 8$  or  $3 + 5 = 8$   
There are 8 pencils altogether.

Draw bars to show each number.



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

Subtract 270 from 400.



h	t	e
3	0	0
-	2	7
1	3	0

$400 - 270 =$

$300 - 200 =$    
 $100 - 70 =$

Hannah had 130 tarts left.



Part-part-whole bar model



Comparing two values

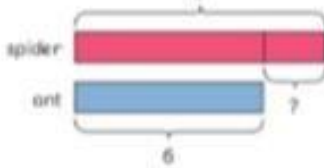
How many more legs does a spider have than an ant?

A spider has 8 legs.

An ant has 6 legs.



Draw bars to show each number.



$8 - 6 = 2$

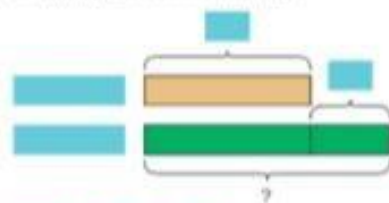
A spider has 2 more legs than an ant.

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

Lulu has 205 beads.  
Holly has 40 more beads than Lulu.  
How many beads does Holly have?



Who has more beads?



=   
Holly has beads.

Should we add or subtract?



Comparative bar model

# Year 3

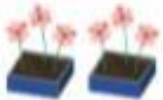
# Multiplication

## Multiplication



Equal groups

1 group of 3  
 $1 \times 3 = 3$

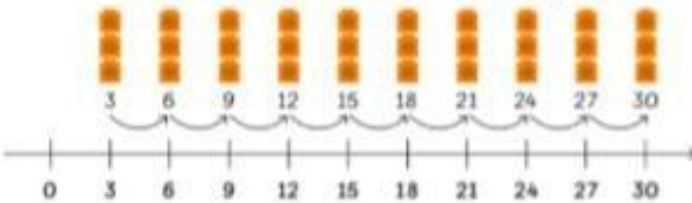


2 groups of 3  
 $2 \times 3 = 6$



3 groups of 3  
 $3 \times 3 = 9$

Count in threes. Number lines and hundred squares



1. Using place value

Multiply 2 ones by 4  
 $2 \times 4 = 8$

$$\begin{array}{r} \text{t} \quad \text{o} \\ 2 \quad 3 \\ \times 4 \\ \hline 8 \end{array}$$



Multiply 2 tens by 4  
 $20 \times 4 = 80$

$$\begin{array}{r} \text{t} \quad \text{o} \\ 2 \quad 0 \\ \times 4 \\ \hline 8 \quad 0 \end{array}$$

There are 80 oranges in the 4 boxes altogether.



2. Number bond method

$$\begin{array}{c} 12 \times 4 = 48 \\ \swarrow \quad \searrow \\ 10 \quad 2 \\ 10 \times 4 \quad 2 \times 4 \end{array}$$

## Year 3

3, 4 and 8 times tables

Language and repeated addition

Use  to make groups of 4.



$1 \times 4 = 4$



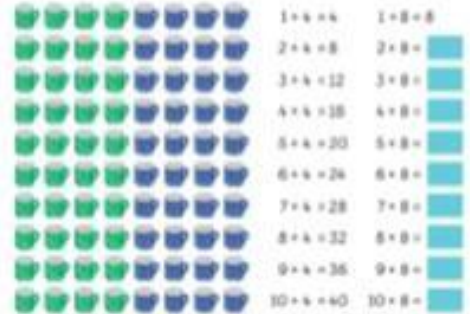
$2 \times 4 = 8$



$3 \times 4 = 12$



Arrays



3. Bridged column multiplication

Step 1

$$\begin{array}{r} \text{t} \quad \text{o} \\ 2 \quad 3 \\ \times 8 \\ \hline 16 \quad 24 \end{array}$$

3 ones  $\times$  8 = 24 ones  
24 ones = 2 tens + 4 ones



4. Short multiplication

Step 2

$$\begin{array}{r} \text{h} \quad \text{t} \quad \text{o} \\ 2 \quad 3 \\ \times 8 \\ \hline 16 \quad 24 \end{array}$$

$23 \times 8 = 184$


The product of 23 and 8 is 184.

2 tens  $\times$  8 = 16 tens  
16 tens + 2 tens = 18 tens




# Year 3

# Division

Put 12  into groups of 4.

**Grouping**



$12 \div 4 = 3$   
3 plates are needed.


**In Focus**



I have 8 coins.  
I have twice as many coins as you.

How many coins does  have?

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



$20 \div 4 = 5$   
 $5 \times 4 = 20$

$20 \div 5 = 4$   
 $4 \times 5 = 20$

We can make a family of multiplication and division equations.

**Let's Learn** Word problems with bar models

1  

Method 1  $8 \div 2 = 16$   
Method 2  $2 \times 8 = 16$

 has 16 coins.


## Family of commutative and inverse calculations

### 1. Number bond method

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

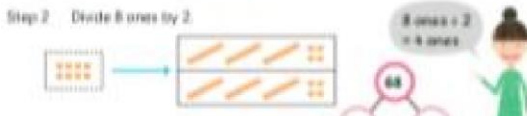
$68 \div 2 =$

Step 1 Divide 6 tens by 2.



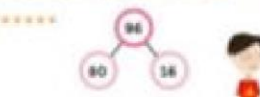
6 tens  $\div 2 = 3$  tens.  
 $60 \div 2 = 30$

Step 2 Divide 8 ones by 2.




8 ones  $\div 2 = 4$  ones.  
 $8 \div 2 = 4$

Step 3 Add the results.  
 $68 \div 2 = 30 + 4 = 34$   
Each person gets 34 sweets.



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



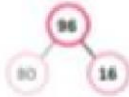
8 tens  $\div 2 = 4$  tens

3 tens  $\div 2 = 1$  ten

$8 \overline{) 96}$   
 $\underline{- 80}$   
16  
 $\underline{- 16}$   
0

$8 \overline{) 96}$   
 $\underline{- 80}$   
16  
 $\underline{- 16}$   
0

### 2. Long division method



16 ones  $\div 2 = 8$  ones

1 ten  $\div 2$  ones = 12

$96 \div 2 = 48$

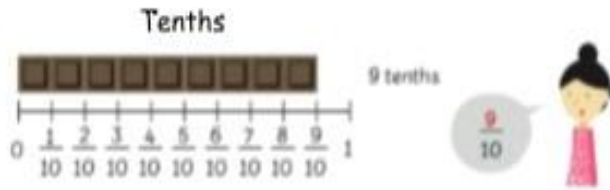
$8 \overline{) 96}$   
 $\underline{- 80}$   
16  
 $\underline{- 16}$   
0

$8 \overline{) 96}$   
 $\underline{- 80}$   
16  
 $\underline{- 16}$   
0

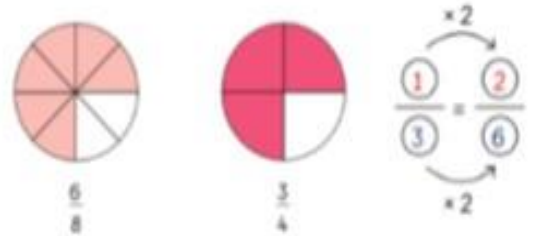
### 3. Move onto problem solving involving these methods and bar models

# Year 3

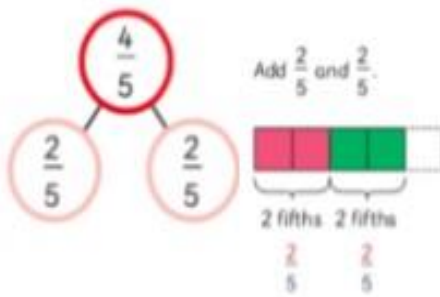
## Fractions



Finding equivalent and simplifying fractions



Adding fractions



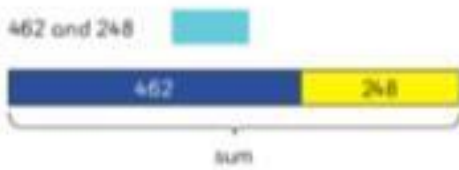
Finding fractions of amounts and sharing more than one



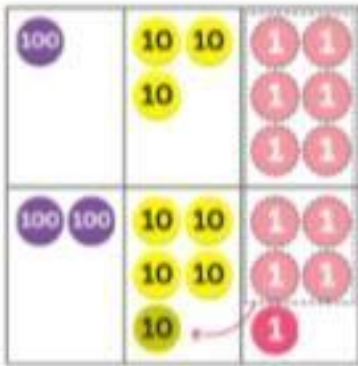
Move onto problem solving involving these methods and bar models



# Place Value



$$\begin{array}{r} 462 \\ + 248 \\ \hline \end{array}$$



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

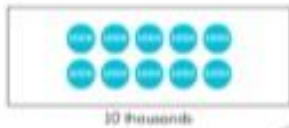
# Place value

## Year 4

Numbers to 10,000



9000  
nine thousand



10 000  
ten thousand

10 thousands = 10 000



Use a place-value chart

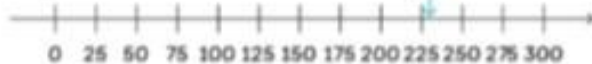
2 thousands + 3 hundreds + 4 tens + 5 ones

thousands	hundreds	tens	ones
2	3	4	5



Number patterns

(in 6, 7, 9, 100, 25 and 1000's)...



$$2345 = 2000 + 300 + 40 + 5$$



2345 is a 4-digit number.



We write 2345 as two thousand, three hundred and forty-five.

# Year 4

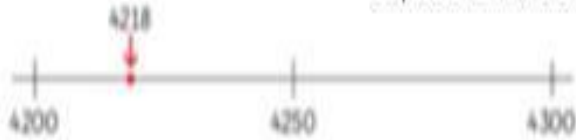
## Place Value

Round 4218 to the nearest 10.

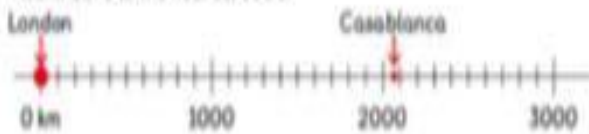


Round 4218 to the nearest 100.

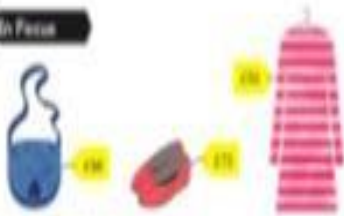
Rounding to the nearest 10, 100 and 1000



Round 2078 to the nearest 1000.



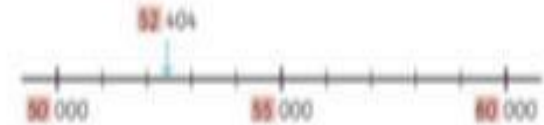
In Price



Rounding to estimate money and distance

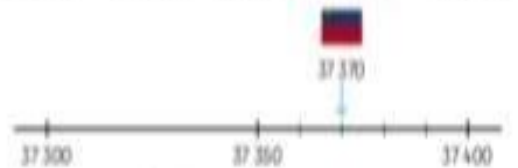
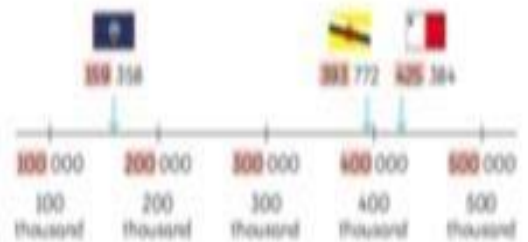
Paula is in the shop shopping.  
She bought a shopping bag for 25p, a pair of shoes for £15 and a book for £18.  
Estimate the total cost of these three items.

St James' Park can seat 52 404.



52 404 is closer to 50 000 than to 60 000.

Rounding to the nearest 100, 1000, 10 000 and 100 000



37 370 is closer to 37 400 than to 37 300.

# Year 4

## Addition

### Adding

#### Year 4

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

Let's estimate.

$$\begin{array}{r} 5700 \\ + 1200 \\ \hline 6900 \end{array}$$

Children are expected to estimate answers to check accuracy

Find the sum of 2034 and 9.



$$\begin{array}{l} 2034 + 10 = 2044 \\ 2034 + 9 = 2043 \end{array} \quad \left. \begin{array}{l} \text{red arrow from } 2044 \text{ to } 2043 \\ \text{1 less} \end{array} \right\}$$

Why is the sum 1 less?

Learning mental strategies to add

Find the sum of 98 and 4142 by adding mentally.

$$98 + 4142 = \boxed{\phantom{0000}}$$

make 100

$$\begin{aligned} 98 + 4142 &= 100 + 4140 \\ &= 4240 \end{aligned}$$



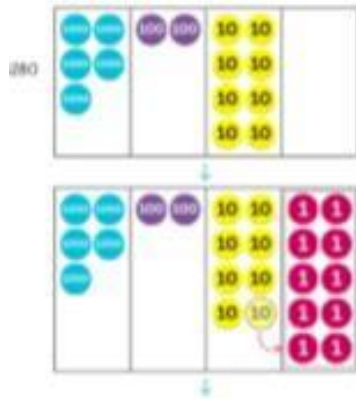
# Year 4

## Addition - No renaming

### Year 4

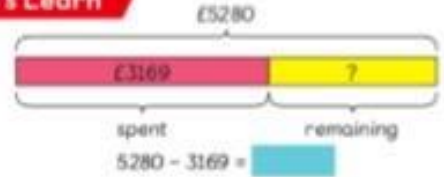
#### In Focus

After Ruby spent £3169, how much was left?



I have £5280 with me.

#### Let's Learn



There aren't enough ones.



$$\begin{array}{r} 5280 \\ - 3169 \\ \hline 2111 \end{array}$$

Children are encouraged to use the inverse calculation to check their answers.

$$\begin{array}{r} 5280 \\ - 3169 \\ \hline 2111 \end{array}$$



$$\begin{array}{r} 2111 \\ + 3169 \\ \hline 5280 \end{array}$$

## Subtraction - no regrouping

1 saved £2314.  
2 saved £4240 more than 1 saved.  
How much did 2 save?

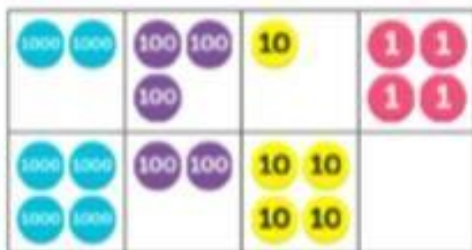
#### Let's Learn



We need to find the sum of 2314 and 4240.

### Year 4

Find the sum of 2314 and 4240.



$$\begin{array}{r} 2314 \\ + 4240 \\ \hline 6554 \end{array}$$

- Step 1 Add the ones.  
4 ones + 0 ones = 4 ones
- Step 2 Add the tens.  
1 ten + 4 tens = 5 tens
- Step 3 Add the hundreds.  
3 hundreds + 2 hundreds = 5 hundreds
- Step 4 Add the thousands.  
2 thousands + 4 thousands = 6 thousand

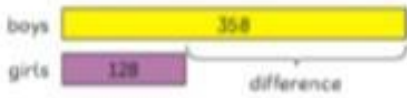
$$2314 + 4240 = 6554$$

# Year 4

## Year 4

Subtracting numbers within 10,000

Find the difference between 358 and 128.



$358 - 128 =$   

When we subtract numbers, we get the difference.



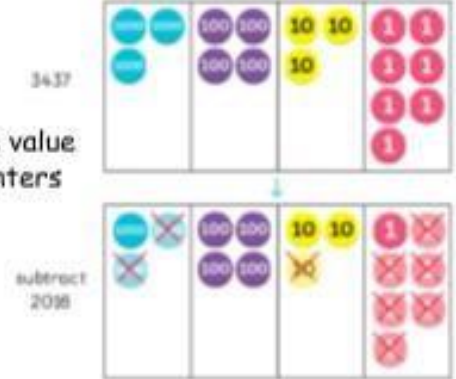
Use base-ten blocks



The difference between 358 and 128 is 230.



Place value counters



# 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?

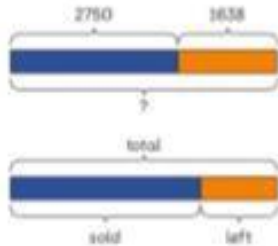


Understand the problem

Who?	baker
What?	cookies

Complex multi-step word problems

Make a plan



Find the total number of cookies he made.



Then, subtract the number of cookies sold.



$$2750 + 1638 = 4388$$

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

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

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?



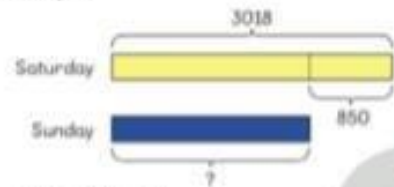
Understand the problem

Who?	people
What?	funfair

Make a plan



Carry out the plan



$$3018 - 850 = 2168$$

2168 people attended the funfair on Sunday.

$$\begin{array}{r} \text{Saturday} \quad 3018 \\ \text{Sunday} \quad + 2168 \\ \hline 5186 \end{array}$$

$$3018 + 2168 = 5186$$



Comparative bar model

# Year 4

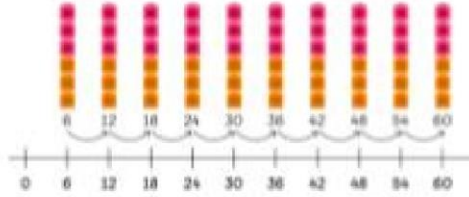
# Multiplication



2 groups of 6  
 $2 \times 6 = 12$



3 groups of 6  
 $3 \times 6 = 18$



By the end of Year 4, children are expected to know ALL of their times tables



$$2 \times 7 = 14$$



$$3 \times 7 = 21$$

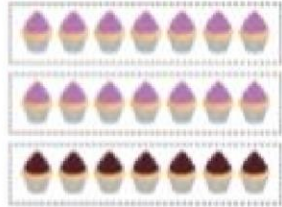
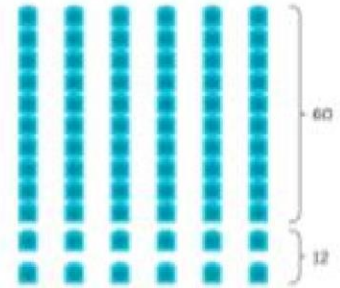


$$3 \times 10 = 30$$

$$3 \times 1 = 3$$

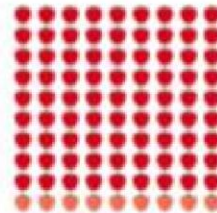
$$3 \times 11 = 30 + 3 = 33$$

$$6 \times 12 = 72$$



$$2 \times 7 = 14$$

$$3 \times 7 = 14 + 7$$



$$10 \text{ rows of } 9 = 90$$

$$10 \times 9 = 90$$



$$10 \times 9 = 90$$

What is  $9 \times 9$ ?  
How can we tell?

Recap: bridged and short multiplication

×	2	3	
		6	
	1	8	
+	1	2	0
	1	3	8

×	2	3	
		6	
	1	3	8

What is the product of 9 and 30?

$$9 \times 30 = \square$$

Method 1

$$\begin{array}{r} 30 \\ 30 \\ 30 \\ 30 \\ 30 \\ 30 \\ 30 \\ 30 \\ 30 \\ + 30 \\ \hline \end{array}$$

Method 2

$$9 \times 3 = 27$$

$$9 \times 3 \text{ tens} = 27 \text{ tens}$$

$$9 \times 30 = 270$$

Method 3

$$9 \times 30 = 9 \times 3 \times 10$$

$$= 27 \times 10$$

$$= 27 \text{ tens}$$

$$= 270$$



New: multiplying 3 numbers

$$2 \times 5 = 10$$

$$2 \times 5 \times 6 = 10 \times 6 = 60$$



$$2 \times 5 = 10$$



$$2 \times 5 \times 6 = 10 \times 6 = 60$$

Which method is best?

Recap multiplying by a multiple of 10

# Year 4

# Multiplication

$$\begin{array}{r} 473 \\ \times 2 \\ \hline 6 \\ 140 \\ + 800 \\ \hline 946 \end{array}$$



Recap:  
Bridged and short  
multiplication

$$\begin{array}{r} 1 \\ \times 473 \\ \hline 946 \end{array}$$

## New: multiplying by multiples of 100

$7 \times 300 = \square$

Method 1

$$\begin{array}{r} 300 \\ 300 \\ 300 \\ 300 \\ 300 \\ 300 \\ + 300 \\ \hline 2100 \end{array}$$

Method 2

$$\begin{aligned} 7 \times 3 &= 21 \\ 7 \times 3 \text{ hundreds} &= 21 \text{ hundreds} \\ 7 \times 300 &= 2100 \end{aligned}$$

Method 3

$$\begin{aligned} 7 \times 300 &= 7 \times 3 \times 100 \\ &= 7 \times 3 \times 100 \\ &= 21 \times 100 \\ &= 21 \text{ hundreds} \\ &= 2100 \end{aligned}$$

21 hundreds = 2100



Which method is best?

# Year 4

# Division

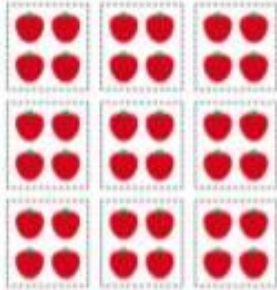
$$36 \div 9 = ?$$

'equal groups'

**VS**

'groups of'

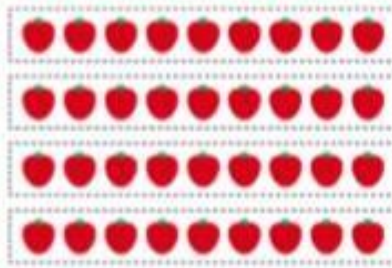
Placing into 9 equal groups



$$36 \div 9 = 4$$

Each group has 4 strawberries.

Placing in groups of 9



$$36 \div 9 = 4$$

There are 4 groups.

There were 11 balloons.



$$11 \div 2 = 5 \text{ remainder } 1$$

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

$$4 \div 4 = \square$$



$$4 \div 4 = 1$$

$$40 \div 4 = \square$$



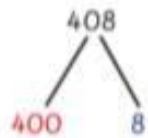
$$40 \div 4 = 10$$

$$400 \div 4 = \square$$

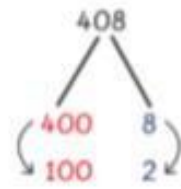


$$400 \div 4 = 100$$

Method 1

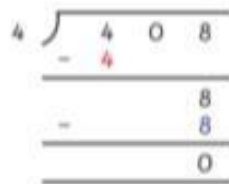


Divide 400.  
Divide 8.

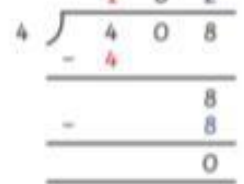


Method 2

4 hundreds  $\div$  4



8 ones  $\div$  4



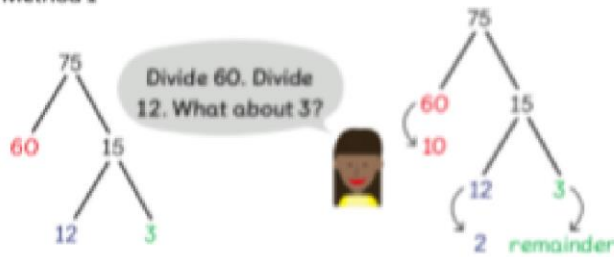
$$408 \div 4 = 102$$

# Year 4

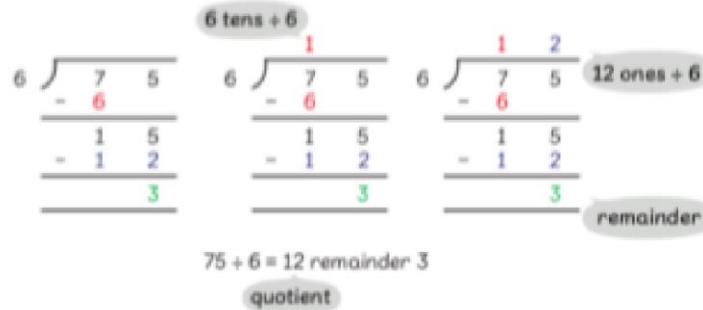
# Division

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

## Hundredths



### Equivalent and simplified fractions



8 smaller parts become 2 larger parts.



4 smaller parts become 2 larger parts.



### Mixed and improper fractions



There are 2 whole cakes and 5 sixths of a cake.

$$2 + \frac{5}{6} = 2\frac{5}{6}$$

$2\frac{5}{6}$  is a mixed number.



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

Move onto problem solving involving these methods and bar models

1 makes 1 1 0.1 0.1 0.1



2 ones + 3 tenths  
 $= 2 + 0.3$   
 $= 2.3$   
 The digit 2 stands for 2 ones.  
 The digit 3 stand for 3 tenths.

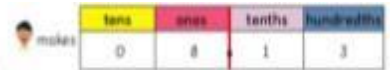
We read 2.3 as two and three tenths.

tenths



### Other areas covered by decimals:

- Comparing and ordering
- Rounding
- Number patterns
- Dividing whole numbers



The digit 3 stands for  $\frac{3}{100}$  0.01 0.01 0.01

8.13 is read as eight and thirteen hundredths.



The digit 3 stands for 3.

The digit 1 stands for  $\frac{1}{10}$

The digit 8 stands for  $\frac{8}{100}$

hundredths

$$\begin{array}{r} 20 + 10 = 2 \\ 3 + 10 = 0.3 \\ 23 + 10 = 2.3 \end{array}$$

I get 2.3 sheets of paper.



$$14 \div 100 =$$

$$\begin{array}{r} 10 \div 100 = 0.1 \\ 4 \div 100 = 0.04 \\ 14 \div 100 = 0.14 \end{array}$$





# 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  $12 \times 12$  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.

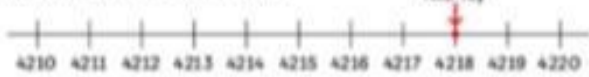
'Sound check' is great practise for the multiplication tables check.





# Year 5

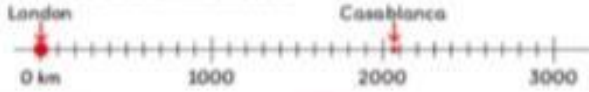
Round 4218 to the nearest 10.



Round 4218 to the nearest 100.  
Rounding to the nearest 10, 100 and 1000



Round 2078 to the nearest 1000.



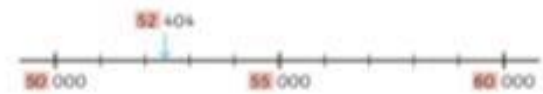
In Focus



Mark another unit shopping. The t-shirt is £10, the pair of shoes is £15 and the dress is £10. Complete the total cost of these three items.

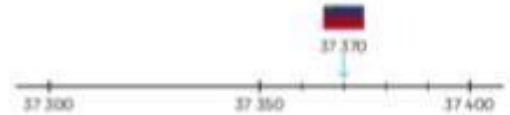
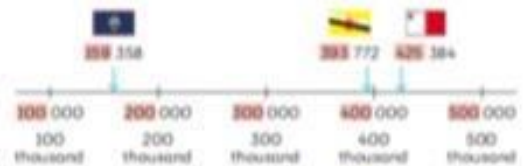
Rounding to estimate money and distance

St James' Park can seat 52 404.



52 404 is closer to 50 000 than to 60 000.

Rounding to the nearest 100, 1000, 10 000 and 100,000

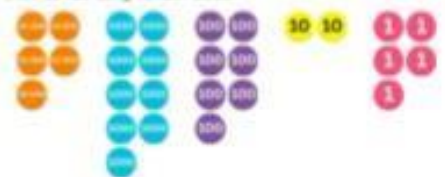


37 370 is closer to 37 400 than to 37 300.

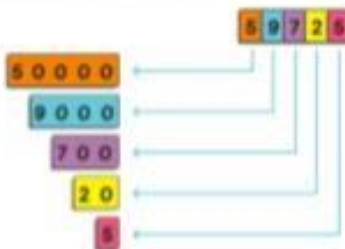
# Place value

Year 5 Numbers to 1,000,000

Show 59 725 using number discs.



Ten thousands	Thousands	Hundreds	Tens	Ones
5	9	7	2	5



One hundred and twenty thousand, one hundred and ten

Comparing and ordering



makes the following numbers.



182 300 is the greatest.

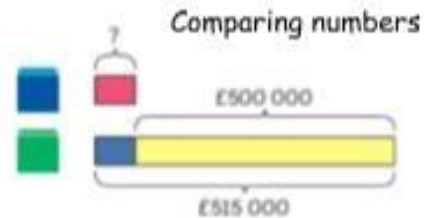


23 665 is less than 23 670.

$$23\ 665 + 23\ 670 = 182\ 300$$



Find the price of each object.



Comparing numbers

Method 1

Make a list.



Count back.

Is it possible to use subtraction?



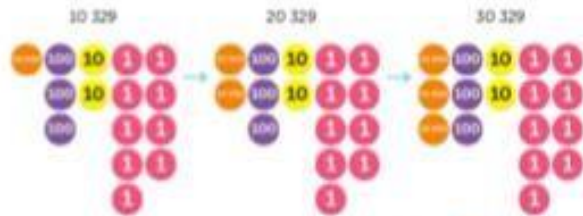
Method 2

Use a number line.



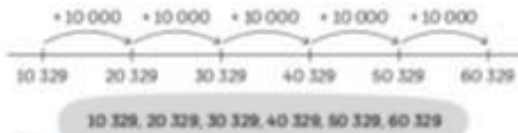
# Year 5

## Adding Year 5



Adding by counting on

Count on.



	A	B	C
1	Date	Trip	Fare
2	13 September	Airport to Hotel	150 000
3	14 September	Hotel to Office	40 000
4		Office to Hotel	45 000
5	15 September	Hotel to Office	43 000
6		Office to Hotel	42 000
7		Hotel to Restaurant	25 000
8		Restaurant to Hotel	21 000
9	16 September	Hotel to Office	46 000
10		Office to Airport	150 000
11			
12		Total for Taxi Fare	582 000

I round each amount nearest 10 000



40 000  
40 000  
+ 40 000  
120 000

Rounding to add by estimate



$37 + 12 = \square$

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

Adding key facts to simplify



$120 + 120 = \square$

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

# Year 5

$16\ 000 + 17\ 000 = \square$



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

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

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

## Year 5

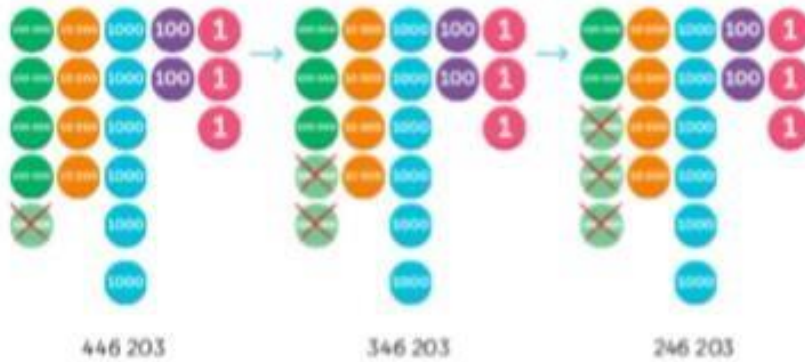
Place value counters to visually support column addition

# Year 5

## Addition - with renaming

## Subtraction

Subtracting by counting back



546 203, 446 203, 346 203, 246 203

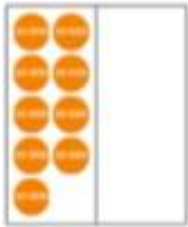


# Year 5

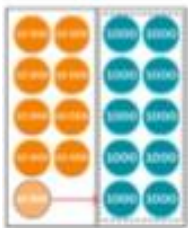
## Subtraction - with regrouping

### Year 5

Place value counters to visually support column subtraction



There are not enough **ones** to subtract 4000.



Rename 90 000.  
90 000  
80 000    10 000

$$\begin{array}{r} 90\ 000 \\ - 54\ 000 \\ \hline \end{array}$$

$$\begin{array}{r} 8\ 10 \\ 9\ 0\ 000 \\ - 54\ 000 \\ \hline \end{array}$$

$$\begin{array}{r} 8\ 10 \\ 9\ 0\ 000 \\ - 54\ 000 \\ \hline 36\ 000 \end{array}$$

$$80\ 123 - 79\ 654 =$$

$$\begin{array}{r} 80\ 123 \\ - 79\ 654 \\ \hline \end{array}$$

$$\begin{array}{r} 7\ 9\ 11 \\ 80\ 123 \\ - 79\ 654 \\ \hline \end{array}$$

$$\begin{array}{r} 7\ 9\ 11 \\ 80\ 123 \\ - 79\ 654 \\ \hline \end{array}$$

$$\begin{array}{r} 7\ 9\ 11 \\ 80\ 123 \\ - 79\ 654 \\ \hline 469 \end{array}$$

Regrouping in each place value column



Take 1 thousand from 80 thousands to make 11 hundreds.



Take 1 hundred from 11 hundreds to make 12 tens.

Take 1 ten from 12 tens to make 13 ones.

Check by estimating.

## Multiplication

# Year 5

## Finding multiples



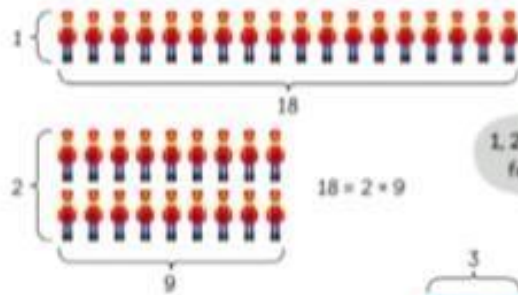
$1 \times 6 = 6$

$2 \times 6 = 12$

$3 \times 6 = 18$

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

## Finding factors



1, 2, 9 and 18 are factors of 18.

## Prime numbers

number	factors
5	1 and 5
7	1 and 7
4	1, 2 and 4
9	1, 3 and 9
6	1, 2, 3 and 6
8	1, 2, 4 and 8

5 and 7 are prime numbers.

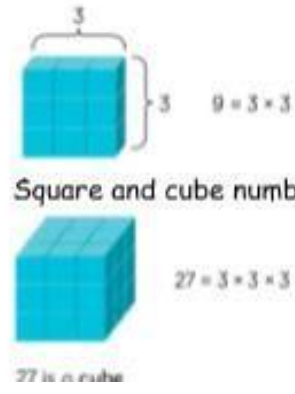
4, 6, 8 and 9 are not prime numbers.

## Common factors

Find the common factors of 48 and 64.

- $48 = 1 \times 48$        $64 = 1 \times 64$
- $48 = 2 \times 24$        $64 = 2 \times 32$
- $48 = 3 \times 16$        $64 = 4 \times 16$
- $48 = 4 \times 12$        $64 = 8 \times 8$
- $48 = 6 \times 8$

The common factors of 48 and 64 are 1, 2, 4, 8 and 16.



Square and cube numbers

27 is a cube

$12 \times 10$	$12 \times 100$	$12 \times 1000$
$12 \times 10 = 12 \times 1$ ten = <b>12</b> tens	$12 \times 100 = 12 \times 1$ hundred = <b>12</b> hundreds	$12 \times 1000 = 12 \times 1$ thousand = <b>12</b> thousands

120

1200

12 000



# Multiplication

# Year 5

$$\begin{array}{r} 2718 \\ \times \quad 4 \\ \hline 32 \\ 40 \\ 2800 \\ + 8000 \\ \hline 10872 \end{array}$$

$$\begin{array}{r} \phantom{2} \phantom{7} \overset{3}{1} 8 \\ \times \quad 4 \\ \hline 2 \end{array}$$

$$\begin{array}{r} \phantom{2} \overset{3}{7} 1 8 \\ \times \quad 4 \\ \hline 72 \end{array}$$

$$\begin{array}{r} \overset{2}{2} \phantom{7} \overset{3}{1} 8 \\ \times \quad 4 \\ \hline 872 \end{array}$$

$$\begin{array}{r} \overset{2}{2} \overset{3}{7} 1 8 \\ \times \quad 4 \\ \hline 10872 \end{array}$$

## Recap:

Bridged and short multiplication but with larger numbers

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

$$2718 \times 4 = 10872$$

$$\begin{array}{r} \phantom{1} \overset{1}{4} \\ 28 \\ \times 26 \\ \hline 168 \longrightarrow 28 \times 6 \\ + 56 \longrightarrow 28 \times 20 \\ \hline 728 \end{array}$$

## New:

Multiplying 2 and 3 digit numbers by 2-digit numbers

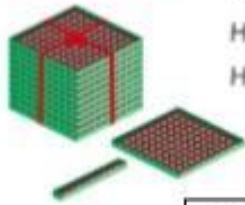
$$\begin{array}{r} \phantom{2} \overset{4}{2} 8 \\ \times 26 \\ \hline 8 \end{array} \longrightarrow \begin{array}{r} \phantom{2} \overset{4}{2} 8 \\ \times 26 \\ \hline 168 \end{array} \longrightarrow \begin{array}{r} \phantom{1} \overset{1}{2} 8 \\ \times 26 \\ \hline 168 \\ 6 \end{array} \longrightarrow \begin{array}{r} \phantom{1} \overset{1}{2} 8 \\ \times 26 \\ \hline 168 \\ 56 \end{array}$$



# 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.

How many 100s in 4700?

$$4700 \div 100 = 47$$

$$47 \text{ hundreds} = 1 \text{ hundred} = 47$$



Here's the remainder.

There are 47 groups of 100 in 4700.

### Dividing by 1000

How many  can we get from 4792?

 contains 1000 pieces.

How many 1000s in 4000?

There are 4  in 4000.

$$4000 \div 1000 = 4$$

$$4 \text{ thousands} = 1 \text{ thousand} = 4$$

There are 4 groups of 1000 in 4000.



### Dividing by 10

How many  can we get from 4792?

 contains 10 pieces.

How many 10s in 4790?

$$4790 \div 10 = 479$$

$$479 \text{ tens} = 1 \text{ ten} = 479$$

There are 479 groups of 10 in 4790.

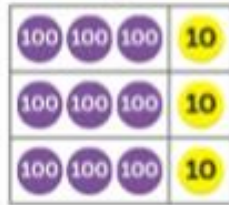


# Year 5

## Further division

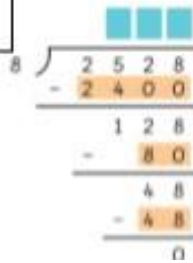
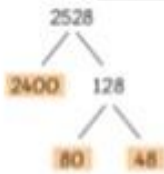
Dividing with place value counters

$930 \div 3$



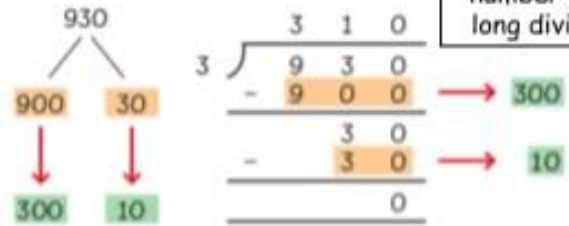
$2528 \text{ ml} \div 8 =$

Dividing a thousands number with long division



## Year 5

Dividing hundred number with long division

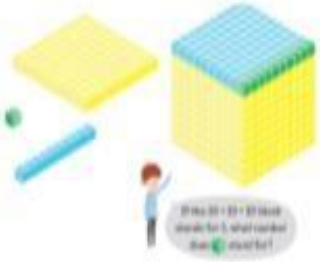


Short division



# Year 5

## Decimals



thousandths

Other areas covered by decimals:

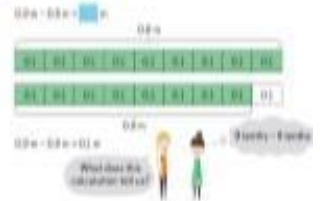
- Comparing and ordering
  - Money
  - Weight
  - Rounding
  - Perimeter

Find the sum and the difference.

0.2 8 tenths + 1 tenth =       8 tenths - 1 tenth =



## Year 5



Adding and subtracting decimals



Using base ten blocks	In numerals	In words
	$\frac{4}{10} = 0.4$	4 tenths
	$\frac{2}{100} = 0.02$	2 hundredths
	$\frac{3}{1000} = 0.003$	3 thousandths

Representing in fractions and decimals



# Fractions

## Year 5

Improper fractions, mixed numbers and simplifying

Adding fraction pairs before adding fractions with different denominators

1 sixth and 4 sixths

$$\frac{1}{6} \text{ and } \frac{4}{6} \text{ make } \frac{5}{6}$$



$$\frac{1}{6} \text{ and } \frac{2}{3} \text{ make } \frac{5}{6}$$

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



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

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

Making denominators the same and simplifying the answers



$$\frac{1}{9}$$

We need to make both the same 'type' of fractions before adding.

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

1 ninth + 1 third is not 2 ninths or 2 thirds!

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

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

$$1 \text{ ninth} + 3 \text{ ninths} = 4 \text{ ninths}$$



# 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

$$\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \\ \hline 1 \quad 1 \end{array}$$

874 - 523 becomes

$$\begin{array}{r} 874 \\ - 523 \\ \hline 351 \end{array}$$

932 - 457 becomes

$$\begin{array}{r} 8 \quad 12 \quad 1 \\ 932 \\ - 457 \\ \hline 475 \end{array}$$

932 - 457 becomes

$$\begin{array}{r} 1 \quad 1 \\ 932 \\ - 457 \\ \hline 475 \\ \hline 5 \quad 6 \end{array}$$

## Multiplication

24 × 16 becomes

$$\begin{array}{r} 24 \\ \times 16 \\ \hline 240 \\ 144 \\ \hline 384 \end{array}$$

124 × 26 becomes

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 2480 \\ 744 \\ \hline 3224 \\ \hline 1 \quad 1 \end{array}$$

124 × 26 becomes

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \\ \hline 1 \quad 1 \end{array}$$

## Division

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \phantom{0} \\ 20 \\ \underline{14} \\ 6 \end{array}$$

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \underline{40} \phantom{0} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{44} \phantom{0} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

## Long Division

$$\begin{array}{r} 543 \\ 24 \overline{) 13032} \\ \underline{120} \phantom{0} \\ 103 \phantom{0} \\ \underline{96} \phantom{0} \\ 72 \phantom{0} \\ \underline{72} \\ 00 \end{array}$$

1 - 24  
2 - 48  
3 - 72  
4 - 96  
5 - 120  
6 - 144  
7 - 168  
8 - 192  
9 - 216