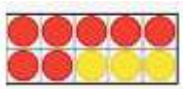
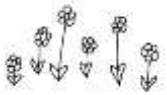
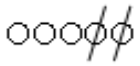
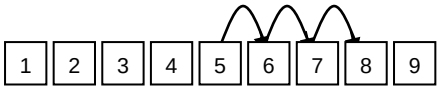
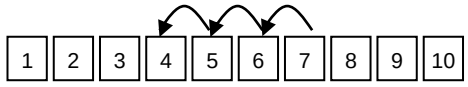
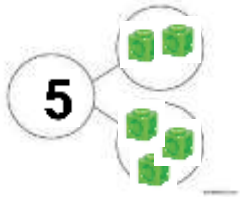
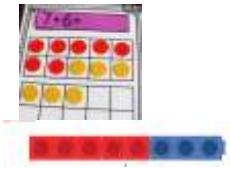
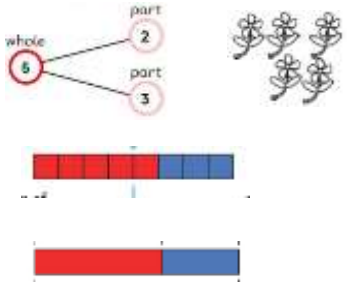
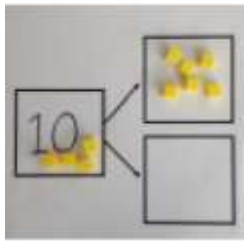
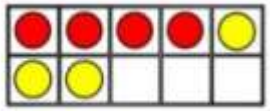
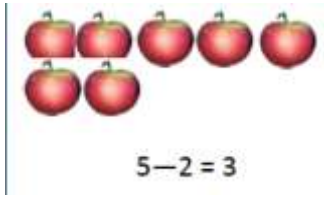
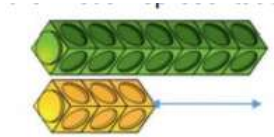
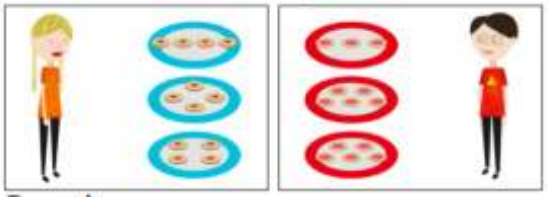
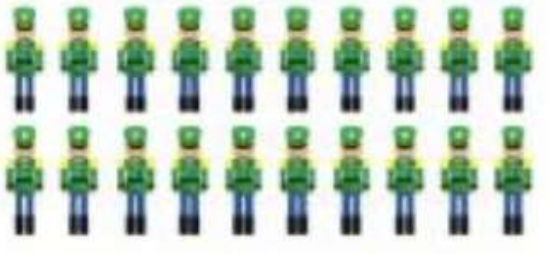
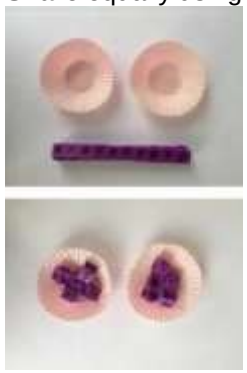
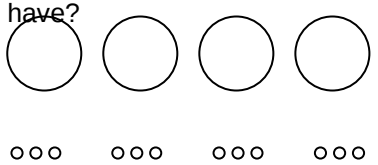
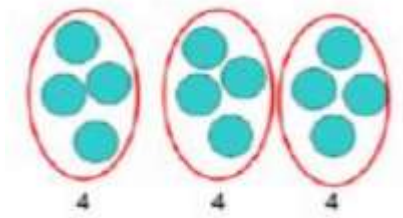
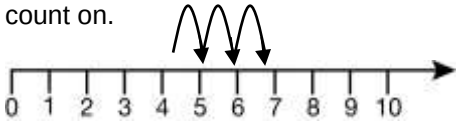
Eliot Bank & Gordonbrock Calculation Policy

Addition	Subtraction	Multiplication	Division
RECEPTION **Concrete** Identify one more Combine amounts to add Find number bonds Add without counting from the beginning    **Pictorial**  3 + 3 = 6	RECEPTION **Concrete** Identify one less Taking away using concrete objects e.g. 5-2=  **Pictorial** 		

Addition	Subtraction	Multiplication	Division
RECEPTION Using a completed number track to count on.  	RECEPTION Using a completed number track to count back.  	RECEPTION Grouping objects. Eg: 2 + 2 + 2 + 2 = 8 4 groups of 2 = 8	RECEPTION **Sharing and grouping** objects. How many groups of 2 in 6? = 3

Addition	Subtraction	Multiplication	Division
YEAR 1 **Concrete** Part-part whole method and bar model with objects to add two numbers  Start with the bigger number and use the smaller number to make 10 on a tens frame, e.g. 7 + 6 =  **Pictorial** Use pictures to add two numbers together using groups and as a bar  	**YEAR 1** **Concrete** Part-part whole method and bar model with objects to subtract two numbers  Using a tens frame and counters, take away corresponding number of counters to solve equations, e.g. 7 - 3 =  Using concrete objects to represent the bar model  Using concrete objects to find the difference 	**YEAR 1** **Concrete** Make equal groups using concrete objects  Add equal groups using concrete objects  Make equal rows using concrete objects  **Pictorial** Count in steps verbally using pictorial representations 	**YEAR 1** **Concrete** **Share** equally using concrete objects  **Sharing** 12 sweets between 4 **groups**…How many do each **group** have?  **Pictorial**  **Abstract** 12 shared between 3 is 4 COUNT IN 10s, 5s AND 2s.

Using a completed number line to count on.

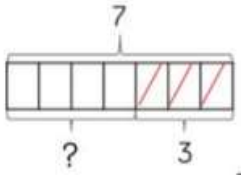


Abstract

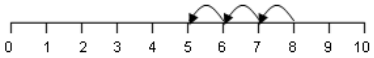
5 + 12 = 17

Start with the bigger number. Use known facts e.g. 5 + 2 = 7 to make connections.

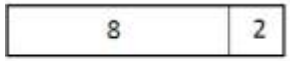
Pictorial



Using a completed number line to count back.



Abstract

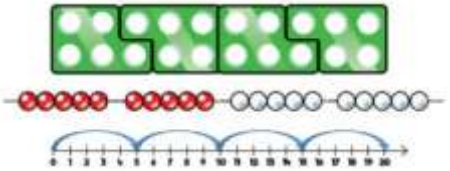


10 = 8 + 2

10 = 2 + 8

10 – 2 = 8

10 – 8 = 2



Abstract

Write addition sentences to represent pictorial images

Move on from using pictures to repeated addition number sentences

2 + 2 + 2 + 2 = 8

4 groups of 2 = 8

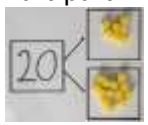
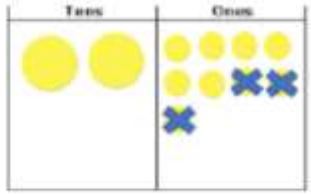
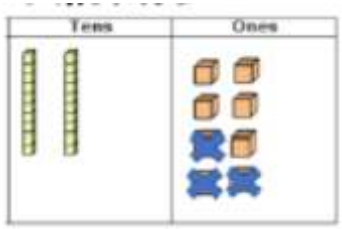
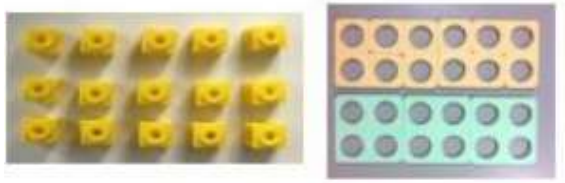
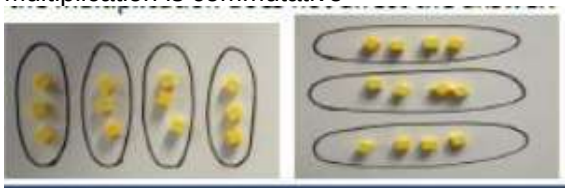
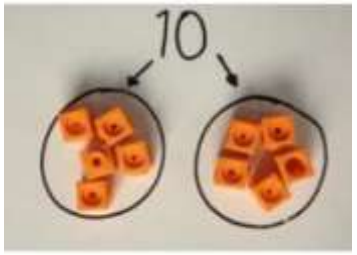
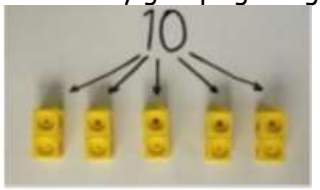
4 x 2

2 x 4

COUNT IN 10s, 5s AND 2s.

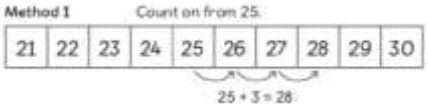
YEAR 1 – with teacher support
YEAR 2
Record using **arrays**.
6 x 2 =

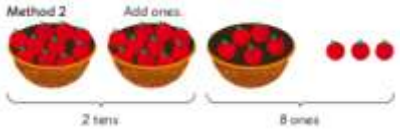
2 x 6 =

Addition	Subtraction	Multiplication	Division
YEAR 2 **Concrete** Part-part whole method  Explore ways to partition any number up to 100  25 + 10 = 35 Explore what happens to each digit when you add 10.	**YEAR 2** **Concrete** Using concrete counters and dienes to take away   **Pictorial**	**YEAR 2** **Concrete** Create arrays using cubes and numicon  Multiplication is commutative  **Pictorial** Use representations of arrays to show different calculations	**YEAR 2** **Concrete** Division by sharing using objects  Division by grouping using objects  **Pictorial** Using pictures for sharing

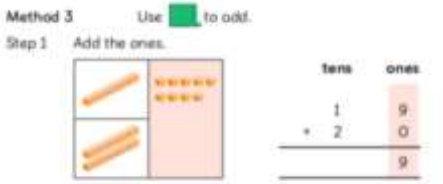
Model adding TO + TO using dienes, numicon and place value counters.

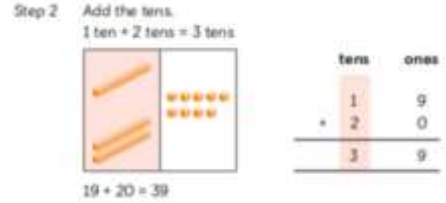
Pictorial





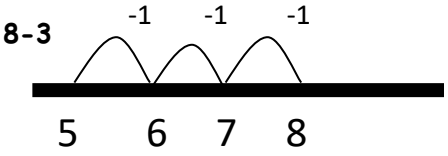
Adding - no renaming

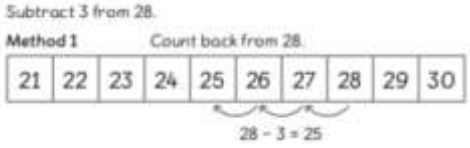


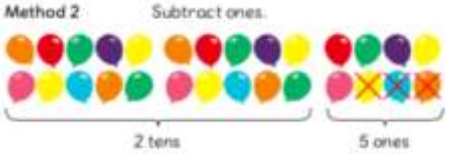


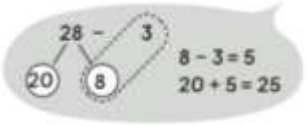
Adding with renaming

Using **empty** number line to count back in ones.

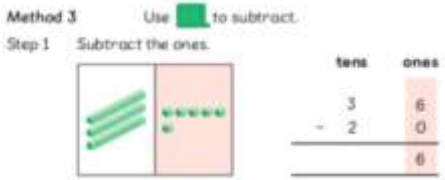


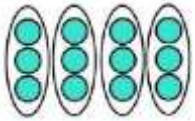


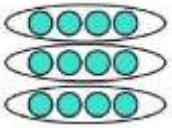




Subtracting - no renaming







Abstract

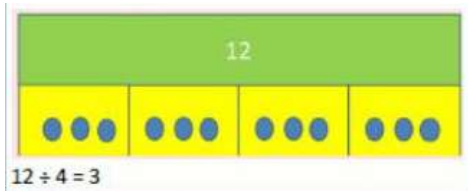
Use an array to write repeated addition and multiplication sentences

5 + 5 + 5 = 15

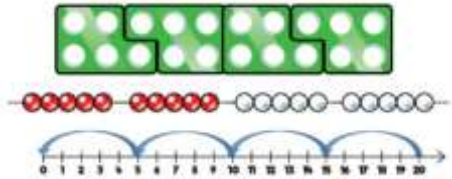
3 + 3 + 3 + 3 + 3 = 15

5 x 3 = 15

3 x 5 = 15

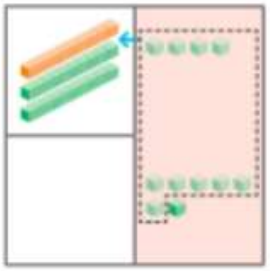
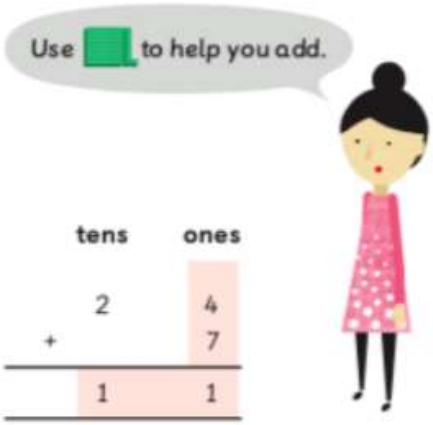
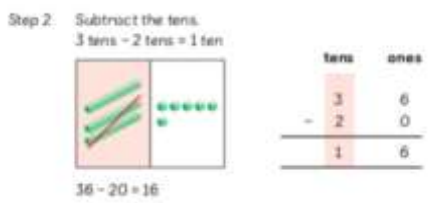
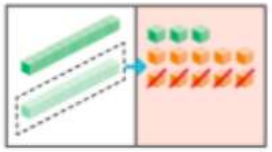
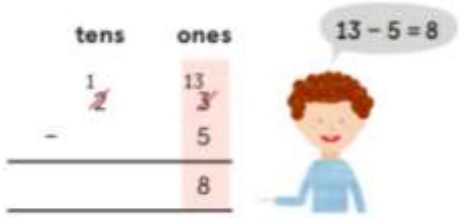


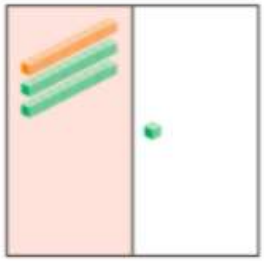
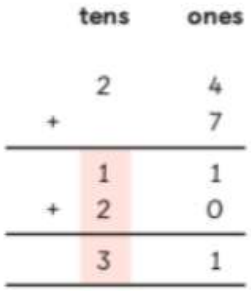
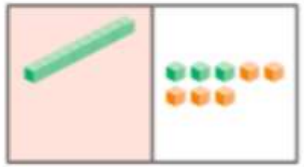
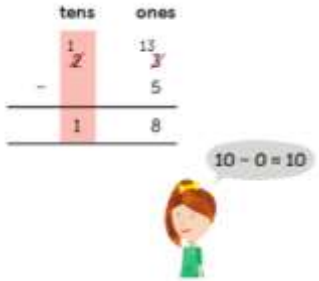
Using pictures for grouping



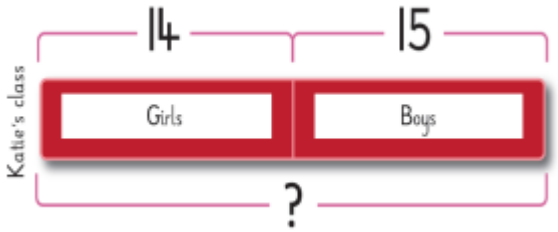
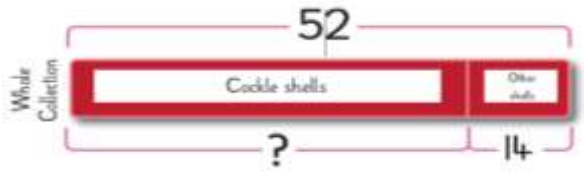
Abstract

$12 \div 3 = 4$

Model exchanging 10 ones for one ten Step 1 Add the ones. 4 ones + 7 ones = 11 ones Regroup the ones. 11 ones = 1 ten and 1 one   	 Subtracting with renaming Step 1 Regroup 1 ten into 10 ones. Subtract the ones. 13 ones − 5 ones = 8 ones   		

Step 2 Add the tens. 1 ten + 2 tens = 3 tens  24 + 7 = 31  	Step 2 Subtract the tens.  23 – 5 = 18  		

Singapore Maths (Bar Model)

Year 2 **Abstract** **Addition** **Part Whole Model** There are 14 girls and 15 boys in Katie's class. How many children are in the class altogether?  	**Year 2** **Abstract** **Subtraction** **Part Whole Model** Denise collects seashells from the beach when she goes on her holiday. She has 52 beautiful seashells. Most of them are cockle-shells. There are 14 shells of other kinds. How many 6 are cockle-shells?  		

Addition

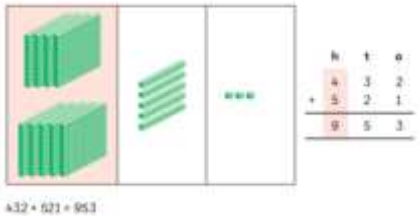
YEAR 3

Concrete

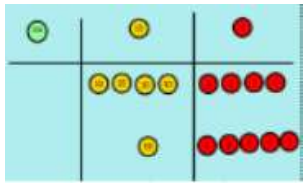
Addition - no renaming

Model using dienes and numicon

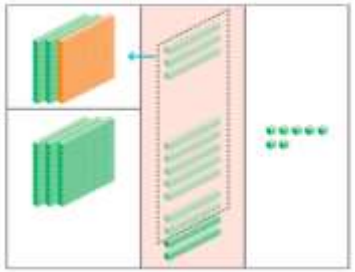
Always add the ones first



Move on to using place value counters



Addition with renaming

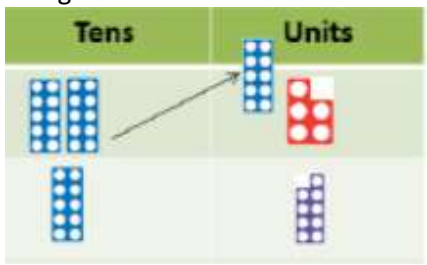


Subtraction

YEAR 3

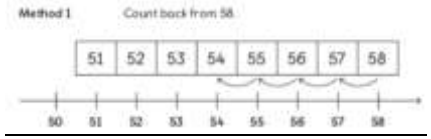
Concrete

Using base 10 or numicon to model

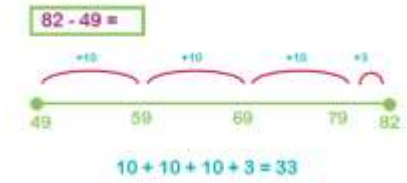


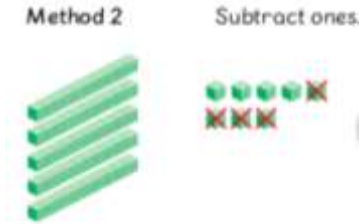
Pictorial

Counting back



Counting on



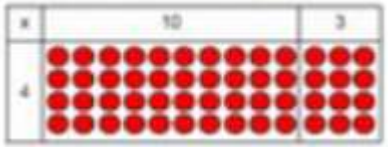


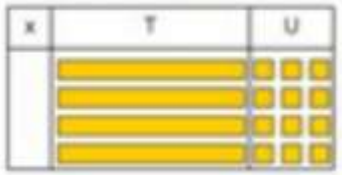
Multiplication

YEAR 3

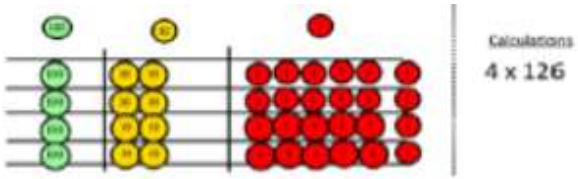
Concrete

Use counters and dienes to introduce the grid method





Fill each row with 126 to represent the calculation 126 x 4



Add up each of the columns, starting with the ones, making any exchanges needed

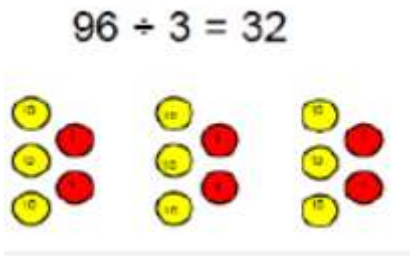
Division

YEAR 3

Concrete

Using numicon and concrete resources to divide by **grouping**

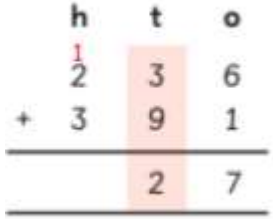
24 divided into groups of 6 = 4



Using arrays to complete number facts

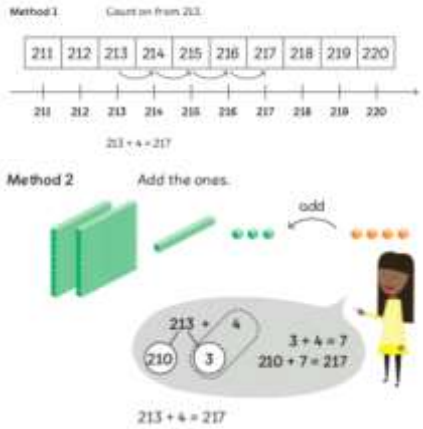
Eg 15 ÷ 3 = 5 5 x 3 = 15

15 ÷ 5 = 3 3 x 5 = 15



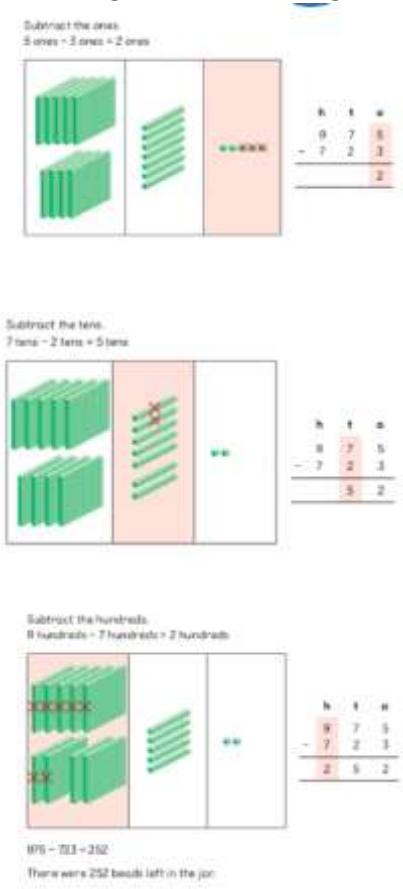
Add the ones
Add the tens
3 tens + 9 tens = 12 tens
Regroup the tens
12 tens = 1 hundred + 2 tens

Pictorial

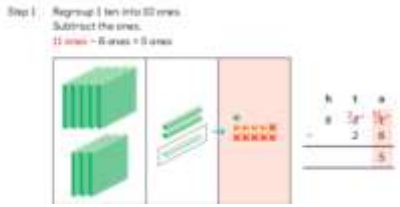


Draw counters using place value charts when adding two numbers

Subtracting without renaming

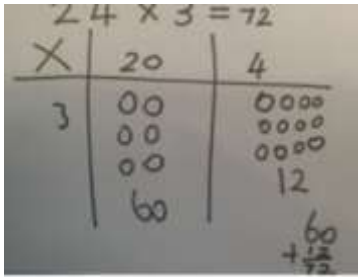


Subtracting with renaming



Pictorial

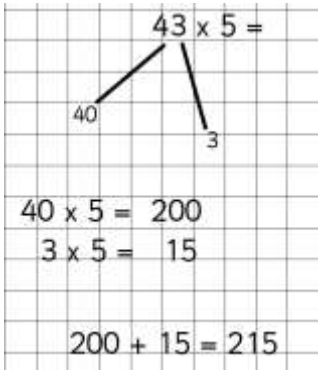
Children draw pictures of counters to represent the grid method

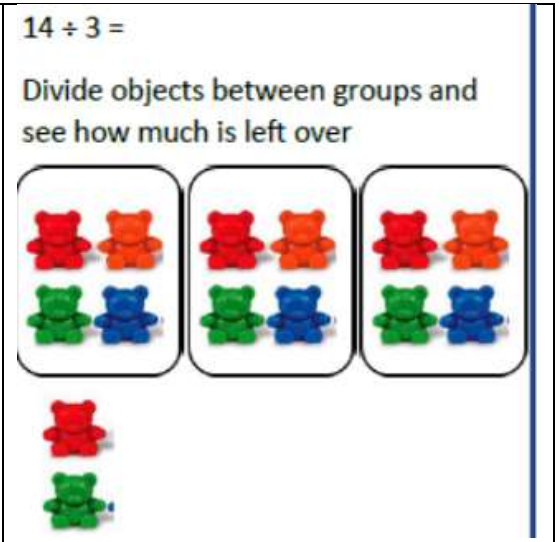


Abstract

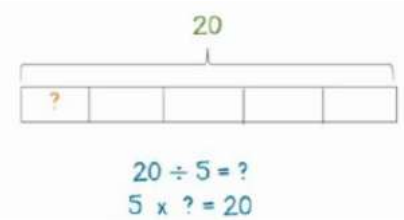
IMPORTANT: In order to move on to the next stage, children MUST be able to…
1)multiply any number by 10
2)multiply any number by 100
3)multiply 1 digit by a multiple of 10 (5 x 30) and multiple of 100 (4 x 600)
4)Multiply multiples of 10 (20 x 50)

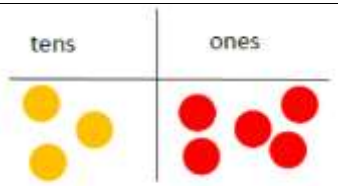
Use partitioning method, then addition



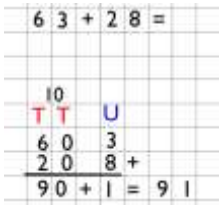


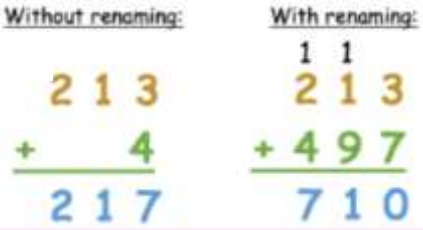
Pictorial

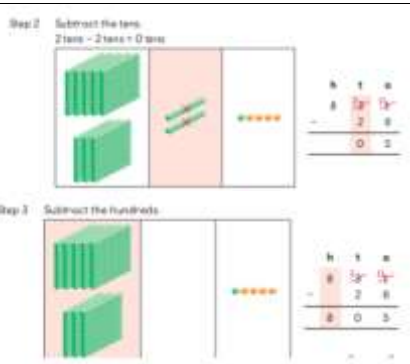




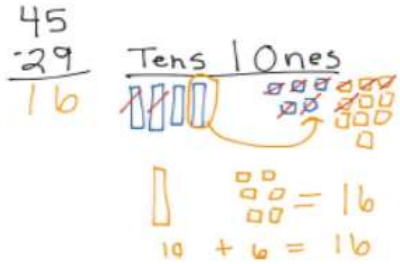
Abstract





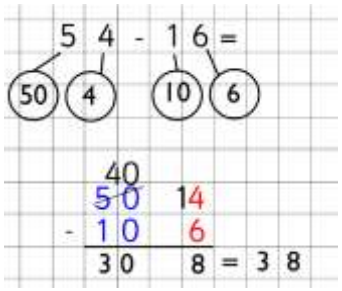


Children may draw base 10 and show the exchanging



Abstract

Partition into place value columns



Move on to formal method

Using the written grid method

×	30	5
7	210	35

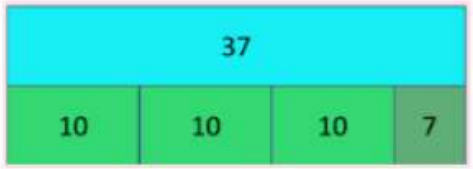
210 + 35 = 245

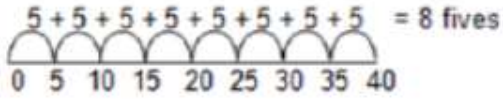
Multiplication as **repeated addition** using an **empty** number line: **5 x 2**

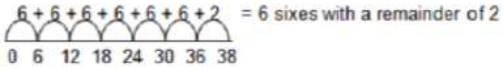
LEARN TIMES TABLES 3 x 4x 8x

Draw dots and group them to divide an amount and clearly show a remainder.

Use bar models to show division with remainders.

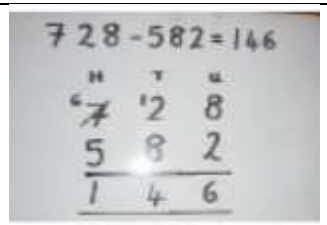






Abstract

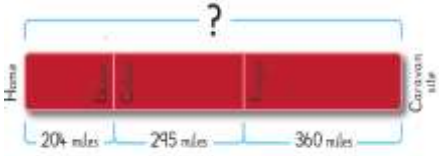
LEARN DIVISION FACTS FOR X3 X 4 X8

Singapore Maths (Bar Model)

Year 3
Addition
Part Whole Model

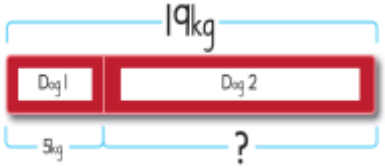
Richard's family went to a caravan in the South of France for their summer holiday. Richard's Dad drove 204 miles to Dover on Wednesday morning; then the ferry carried them to Calais in France. From Calais, Richard's Dad drove 295 miles to Troyes where the family stayed overnight. On Thursday morning, he drove the final 360 miles to their caravan site. How far did Richard's Dad drive altogether?



Comparison Model

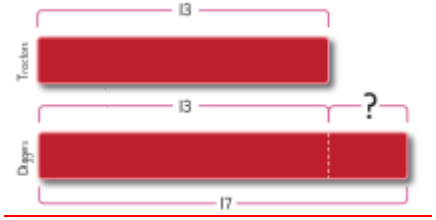
Year 3
Subtraction
Part Whole Model

Two dogs weigh 19kg. The first dog weighs 5kg. How much does the second dog weigh?



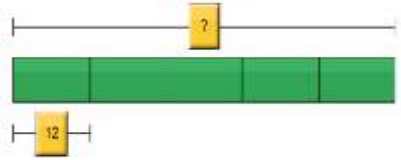
Comparison Model

Tom and Finley were sorting the wheeled toys in the outdoor area. They found 13 tractors and 17 diggers. How many more diggers were there than tractors?



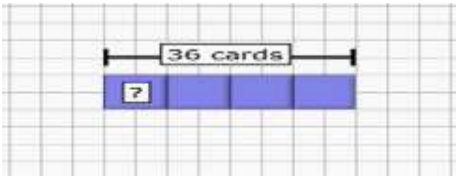
Year 3
Multiplication

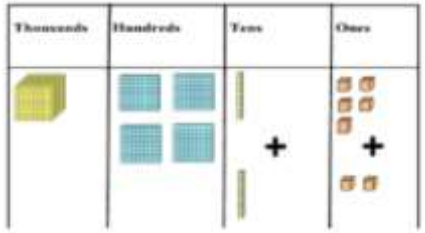
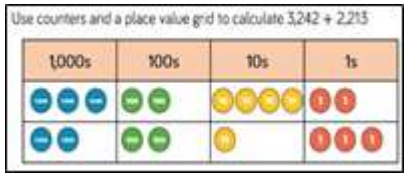
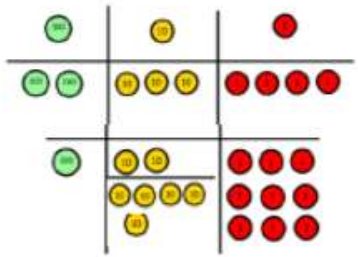
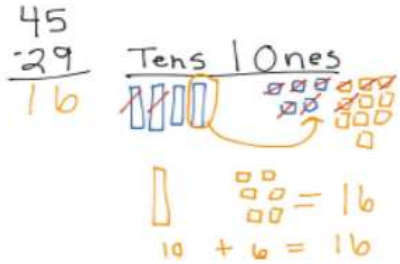
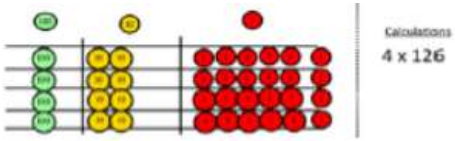
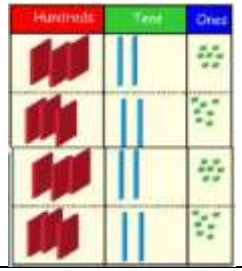
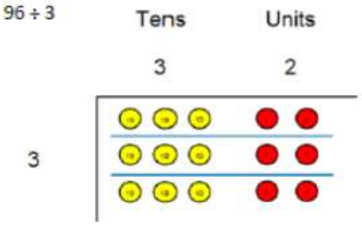
There are 12 pencils in a pack. Shirley gives out 5 packets of pencils. How many pencils does she give out altogether?

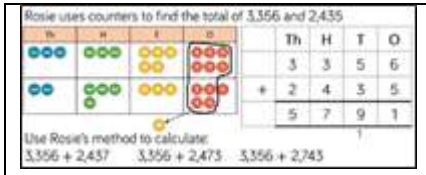


Year 3
Division

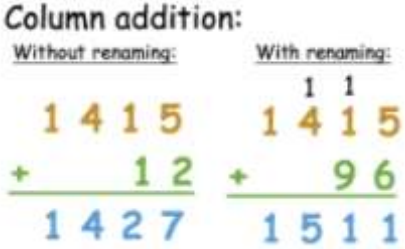
Kelly has 36 Lego cards. She sorted them into 4 equal piles. How many Lego cards were in each pile?



Sam had 13 Pokemon cards. Jim had 21 more cards than Sam. How many Pokemon cards does Jim have? 			
Addition	**Subtraction**	**Multiplication**	**Division**
YEAR 4 **Concrete** Column addition Using dienes and place value counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand   **Pictorial** Using pictures to move on to abstract column addition method	**YEAR 4** **Concrete** Model process of exchanging using dienes and numicon. Then move on to using place value counters 234 - 179  **Pictorial** **Draw to show the exchange using dienes or place value counters** 	**YEAR 4** **Concrete** Recap using concrete resources to represent the grid method Fill each row with 126 to represent the calculation 126 x 4  Add up each of the columns, starting with the ones, making any exchanges needed Use dienes to represent column multiplication - multiply the ones first 	**YEAR 4** **Concrete** Use place value counters to divide by a single digit number 96 ÷ 3 



Abstract



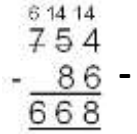
Extend to decimals - double check if adding decimals is in the year 4 curriculum

IMPORTANT: Children must understand how to insert zeros as place holders when dealing with decimal numbers.

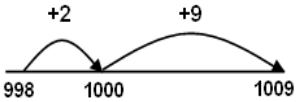
Abstract

Column subtraction

***Always start with ones**exchange only for units, then tens, then both**extend to thousands etc**extend to decimals** - check Y4 curriculum for this*

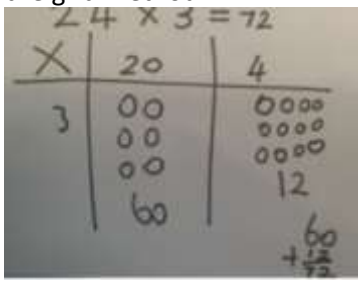


IMPORTANT: Do not use columns to subtract from a number with **lots of zeros** or when numbers are **close** together…teach the children to let the numbers determine the best method: **1009 – 998 = 11**



Pictorial

Recap drawing counters to represent the grid method



x	300	20	7
4	1200	80	28

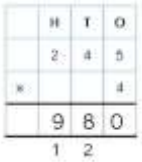
Abstract

Short expanded method

127 x 6 = 762

1 2 7
x 6
4 2 (6x7)
+ 1 2 0 (6x20)
6 0 0 (6x100)
7 6 2

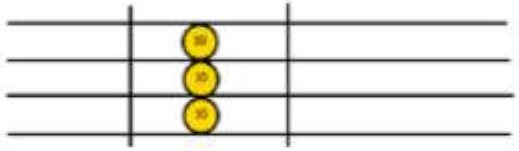
Move on to short formal method



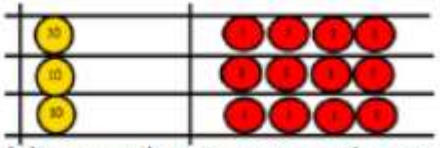
LEARN TIMES TABLES X6 X7 X9 X11 X12

42 ÷ 3=

Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

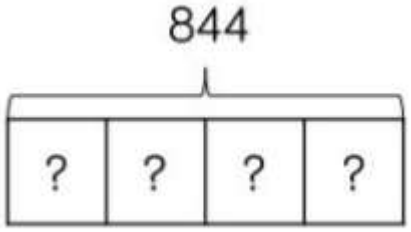


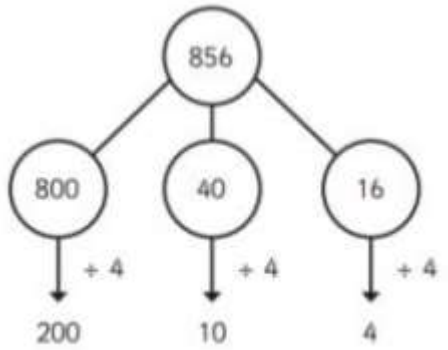
We exchange this ten for ten ones and then share the ones equally among the groups.



We look how much in 1 group so the answer is 14.

Pictorial





Abstract

98 ÷ 7 = 14

$$7\overline{)\,9^{2}8}\quad 1\,4$$

...and with remainers

432 ÷ 5 = 86 r2

$$5\overline{)\,4^{4}3^{3}2}\quad 0\,8\,6\ r\,2$$

LEARN DIVISION FACTS FOR X 6 x 7 x9 X11 X12

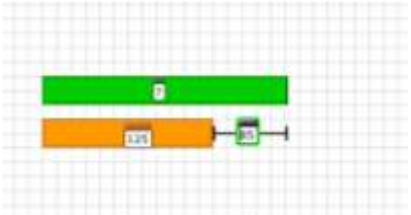
Singapore Maths (Bar Model)

Year 4
Abstract
Addition
Part Whole Model

The population of a village was 5678. Then, it increased by 1235 people. What was the population of the village after the increase?

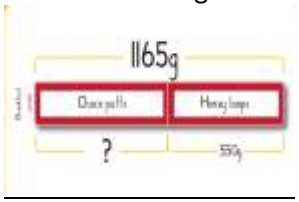
Comparison Model

David has collected 125 Lego cards. Harry has 85 more cards. How many cards does Harry have?



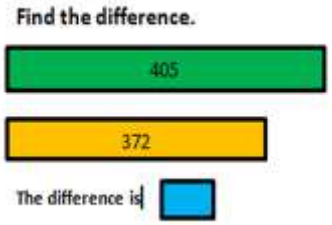
Year 4
Abstract
Subtraction
Part Whole Model

There are two boxes of breakfast cereal in Adam's basket. Together they weigh 1165kg. The Honey Loops are 550g. What do the Choco Puffs weigh?



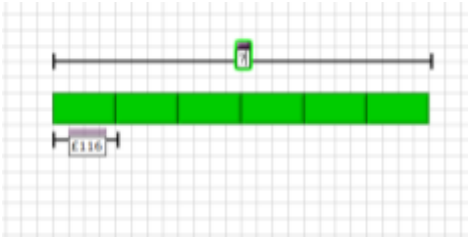
Comparison Model

There are 405 apples and 372 oranges. How many may more apples than oranges are there?



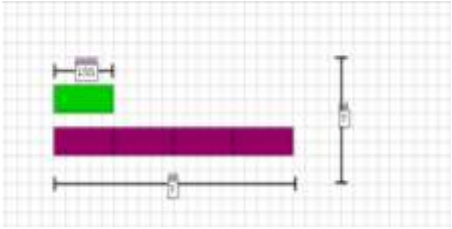
Year 4
Abstract
Multiplication
Part Whole Model

Each ticket from London to Manchester costs £116. How much will 6 tickets cost from London to Manchester?



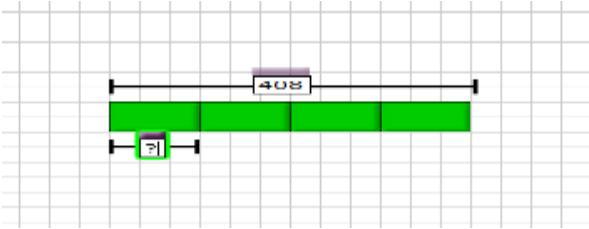
Comparison Model

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



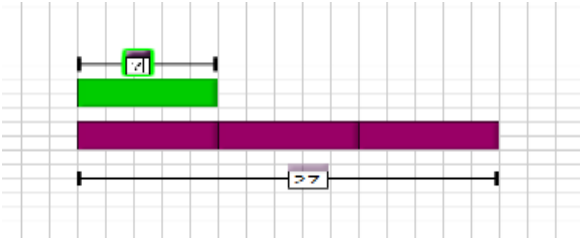
Year 4
Abstract
Division
Part Whole Model

Jenny made 408 chocolate cakes to sell. She put them into boxes of 4. How many boxes did she get?



Comparison Model

There are 27 red flowers. There are 3 times as many red flowers as white flowers. How many white flowers are there?



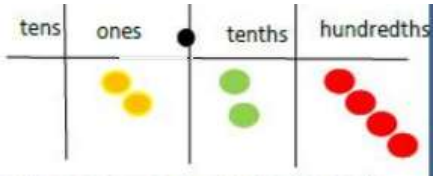
Addition

YEAR 5 & YEAR 6

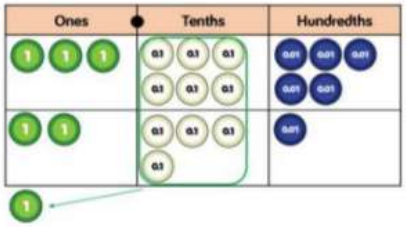
Continue using methods from Y4 for adding whole numbers

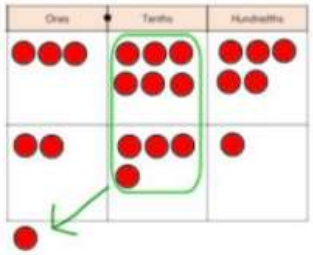
Introduce adding decimals

Concrete



Pictorial





Subtraction

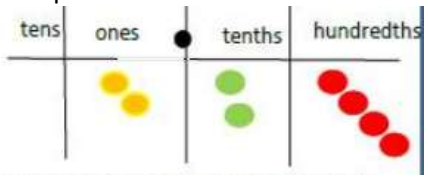
YEAR 5 & YEAR

Continue using methods from Y4 subtraction with and without renaming.

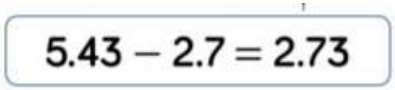
Introduce subtracting decimals

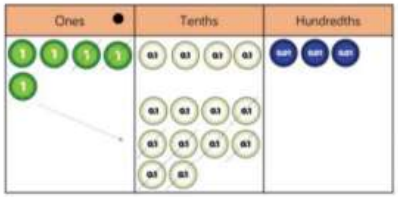
Concrete

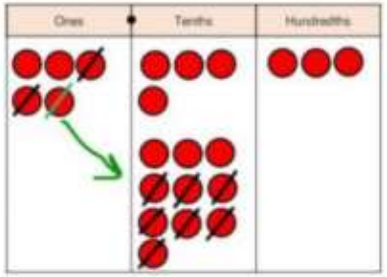
Use place value counters



Pictorial







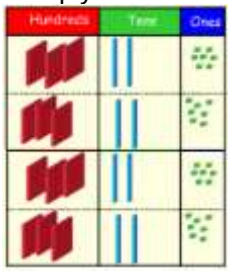
Abstract

Multiplication

YEAR 5 & YEAR 6

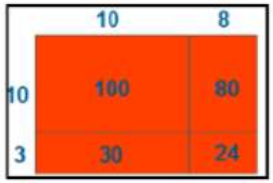
Concrete

Multiply the ones first



Pictorial

×	300	20	7
4	1200	80	28



Abstract

Expanded long multiplication

23 x 13 = 299

23
X13
9 (3 x 3)
60 (3 x 20)
+30 (10 x 3)
200 (10 x 20)
299

Moving on to formal long multiplication

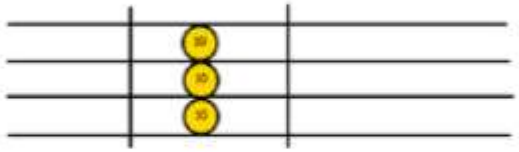
Division

YEAR 5 & YEAR 6

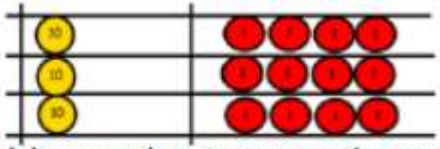
Concrete

42 ÷ 3=

Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

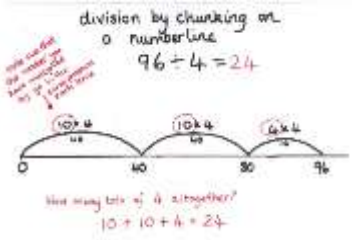


We exchange this ten for ten ones and then share the ones equally among the groups.

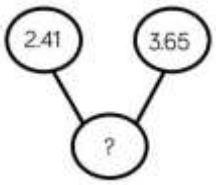


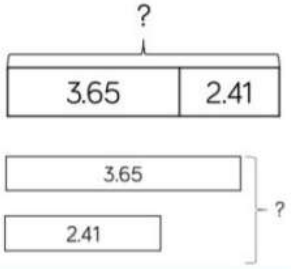
We look how much in 1 group so the answer is 14.

Pictorial

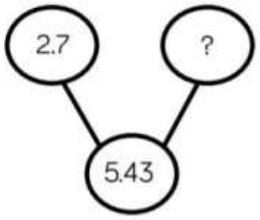


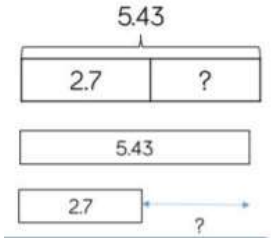
Abstract





$$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ \hline 1 \end{array}$$

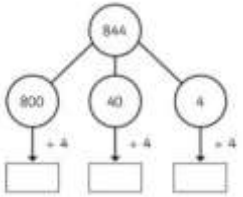




$$\begin{array}{r} {}^{4}\cancel{5}^{1}.43 \\ +\ 2.7 \\ \hline 2.73 \end{array}$$

$$56 \times 27 = 1512$$

$$\begin{array}{r} 5\ 6 \\ \times\ 2\ 7 \\ \hline 3\ 9^{4}2 \\ +\ 1\ 1^{1}2\ 0 \\ \hline 1\ 5\ 1\ 2 \\ \hline 1 \end{array}$$



Abstract

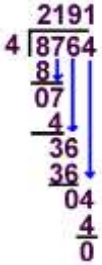
256 ÷ 7 = **36 R4**

256
- 140 (20 x 7)
116
- 70 (10 x 7)
46
- 42 (6 x 7)
4

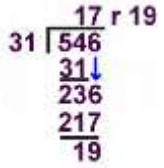
Family of Facts:
20 x 7 = 140
10 x 7 = 70
5 x 7 = 25
2 x 5 = 10
1 x 5 = 5

Long Division (bus stop method)

8764 ÷4 = 2191



546 ÷ 31 = 17r19



Short Division (bus stop method)

	9 7

			3 | 2 $9^{2}1$ General Rule: When dividing by a single digit = bus stop When dividing by a double digit = vertical chunking… then long division
Singapore Maths (Bar Model)			
Year 5 & 6 **As Above**	**Year 5 & 6** **As above**	**Year 5 & 6** **As above**	**Year 5 & 6** **As above**