Fishponds

Church of England Academy

'Loving to Learn, Learning to Love'

Calculation Progression

Key Stage One

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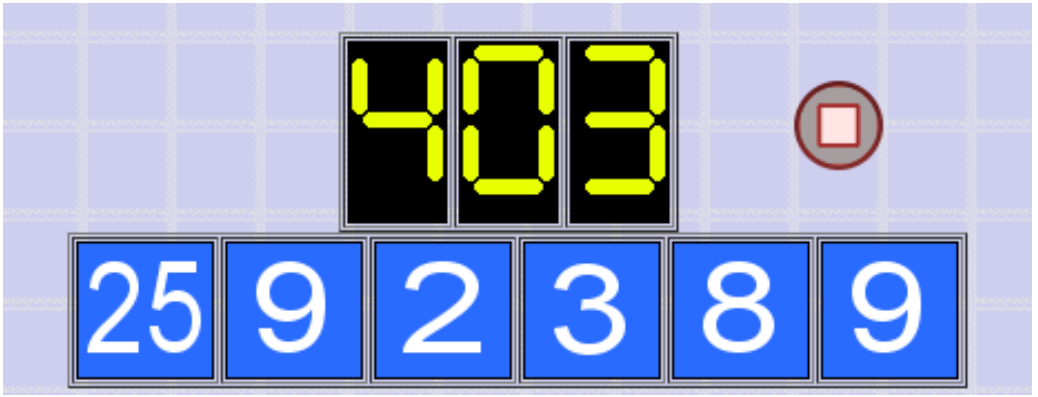
Calculation Progression

Aims:

- To share our calculation progression in Maths through KS1.
- To share the methods that we use for addition, subtraction, multiplication and division.
- To share the practical and visual resources that we use to teach calculation in KS1.
- To share resources that will help you to support your child/ children at home with calculation.



https://www.youtube.com/watch?v=M2dhD9zR6hk

"That is too hard!"

"I don't know where to start."

"I didn't have time."

"I'm not very good at Maths."

403

25 9 2 3 8 9

partner | time | practical resources

prior learning | practice | differentiation

visuals | methods | confidence

prior learning

I know 10 x 4 = 40

I know 40 x 10 = 400

visuals

methods

+ 9

25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

25 9 2 3 8 9

prior learning

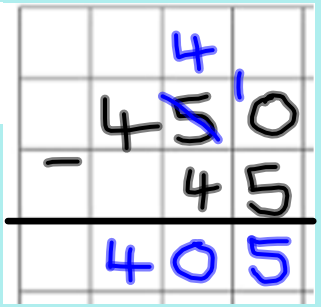
I know 10 x 45 = 450

So 9 x 45 is 45 less than 450

methods

45 x 9 = 405

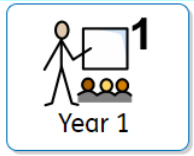
-2 = 403



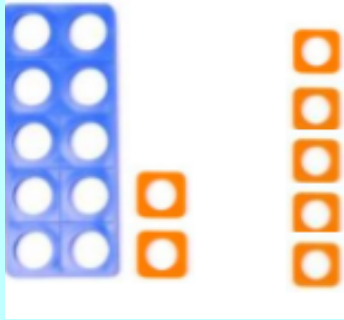
Why is progression in calculation important?

It gives the children the building blocks that they need to be successful in Mathematics and supports them to develop their calculation methods from EYFS to Year 6... and beyond!

Why is progression in calculation important?

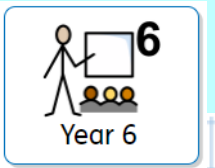


12 + 5



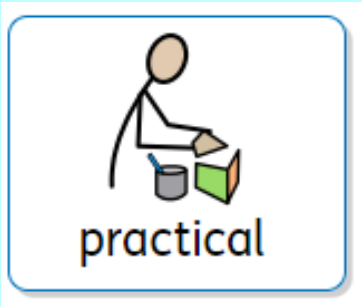
134 + 23 =

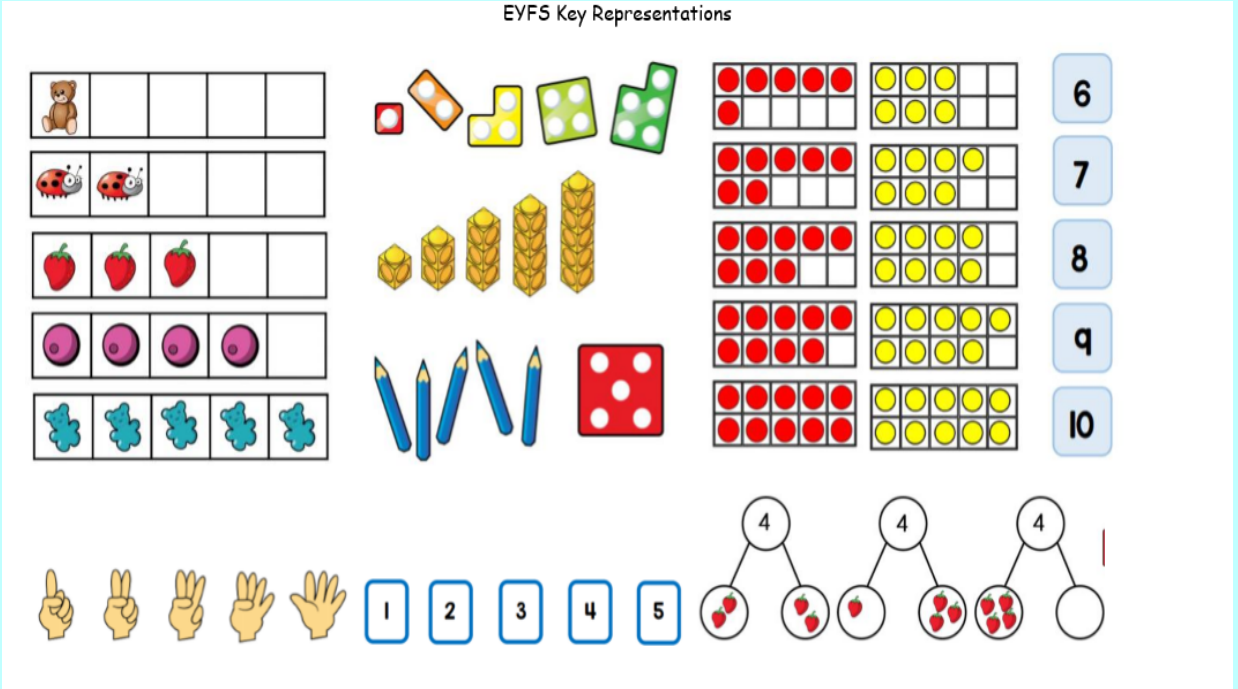
100s	10s	1s
100	10 10 10	1 1 1 1
	10 10	1 1 1



		2	6	4	5	9
		3	5	5	4	7
+		6	3	4	3	2
	1	2	5	4	3	8

Where the children start with calculation in Reception:





Early Learning Goal: Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.

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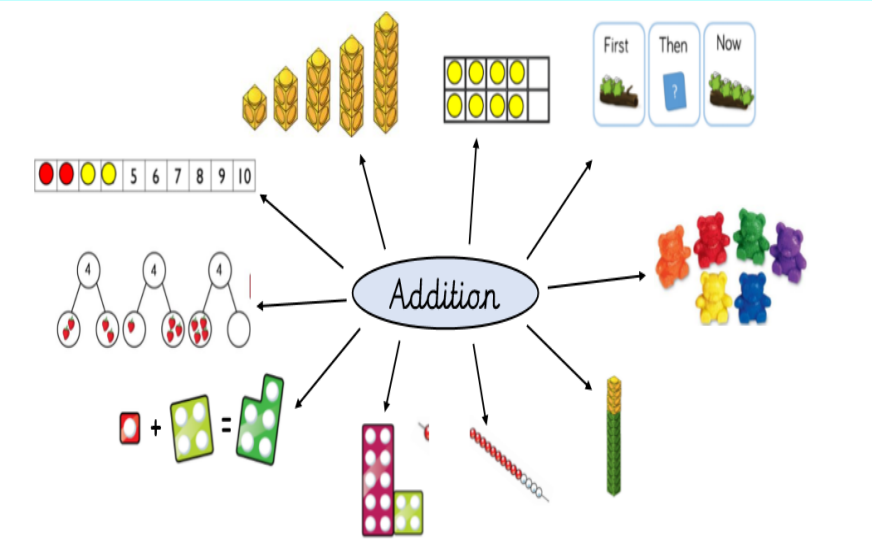

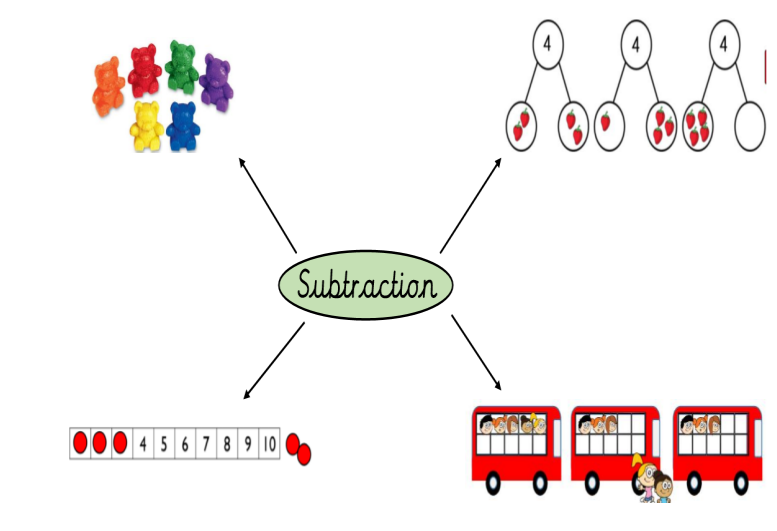

Early Learning Goal: They solve problems, including doubling, halving and sharing.

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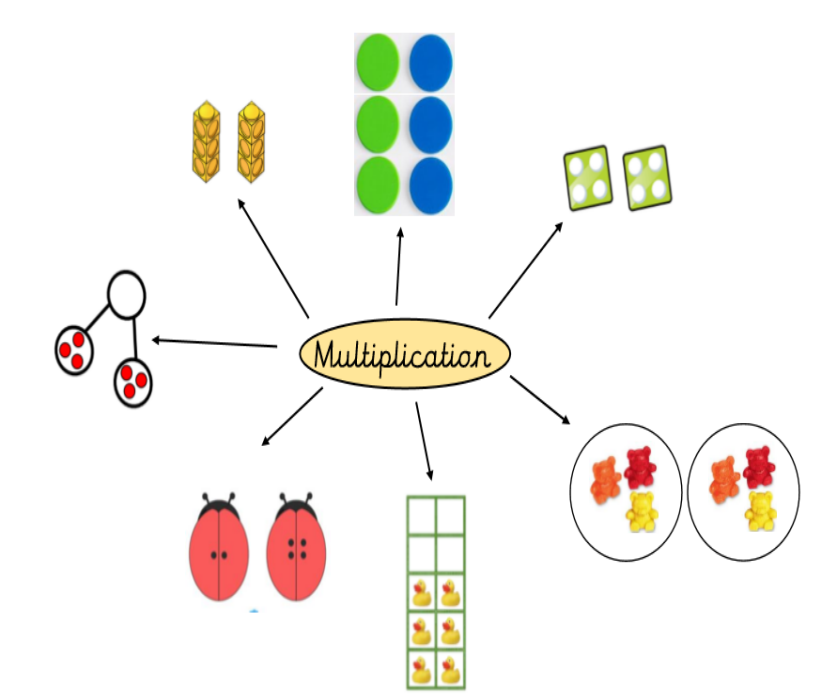
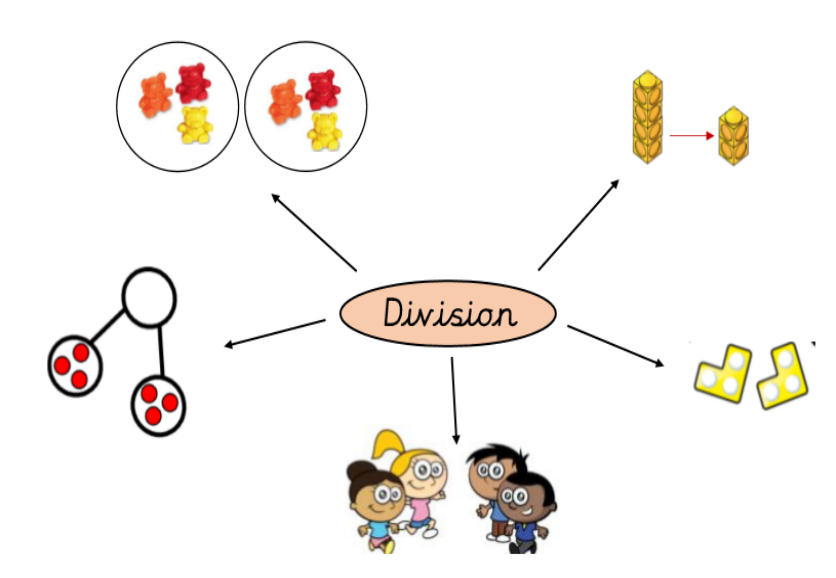
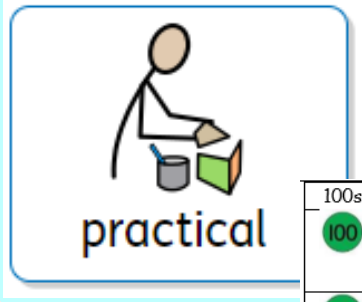
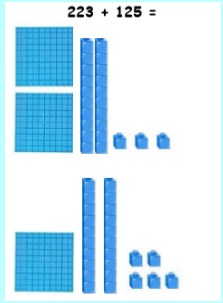
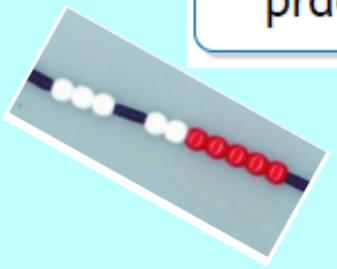


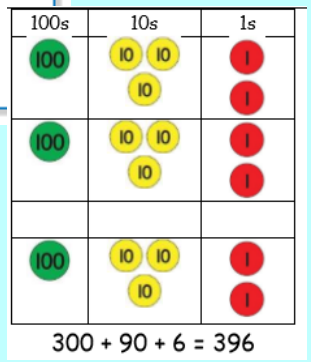


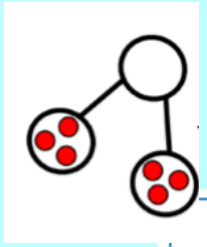
They use practical and pictorial throughout each year group!

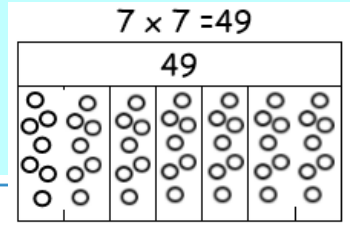


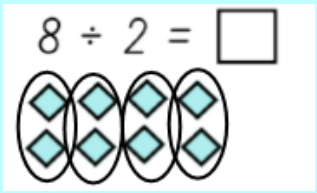


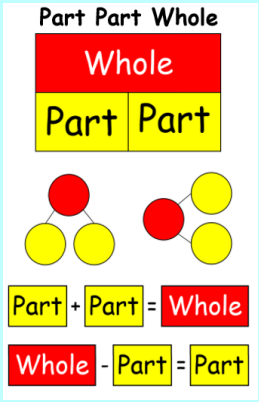






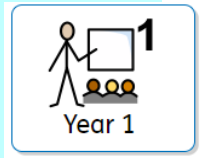




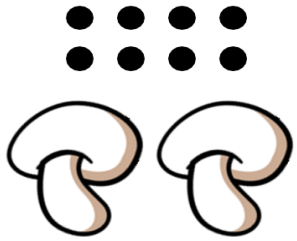


We also apply our calculation methods to reasoning and problem solving, throughout each year group!

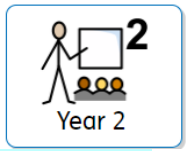
We call them the going deeper fish challenges!



All the dots have fallen off 2 toadstools.



How many different ways can you put them back on?



Both missing numbers are less than 10

$7 + \square < 7 + \square$

How many different possible answers can you find?

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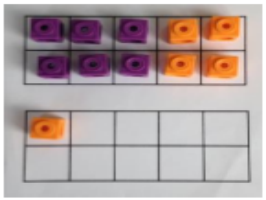
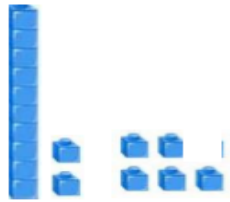
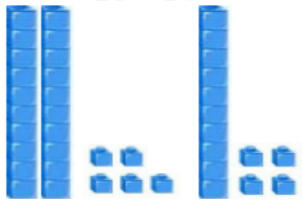
Year 1	Year 2
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including zero solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = - 9.	Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures Applying their increasing knowledge of mental and written methods Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ♣ a two-digit number and ones ♣ a two-digit number and tens ♣ two two-digit numbers ♣ adding three one-digit numbers

Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot

Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Year 1	Year 2
Pictures 6+5 = **Tens frames** 6 + 5 =  **Numicon** 6 + 5 = 	**Base 10** 12 + 5  Count the tens and count on in ones 25 + 14 =  Count the tens then count on in the ones.

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Year 1	Year 2
12 + 5	25 + 17 =
Base 10 12 + 5	Count the tens then count on in the ones. Model exchanging the ones for a ten and 2 ones.

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Year 1 Year 2

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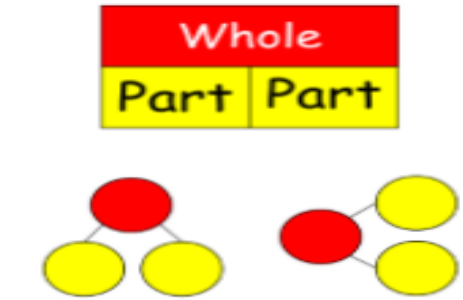
Part Part Whole

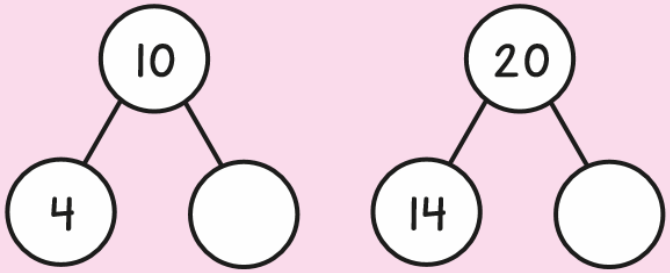


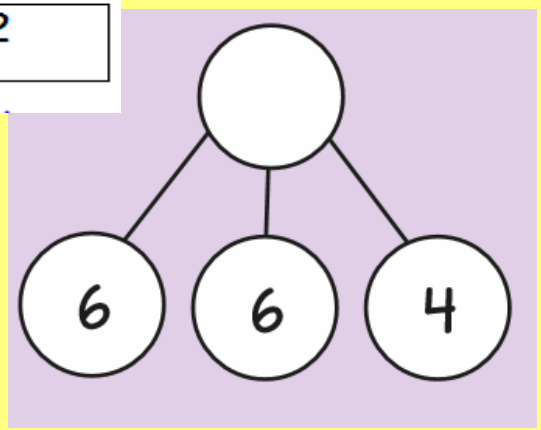
Part + Part = Whole

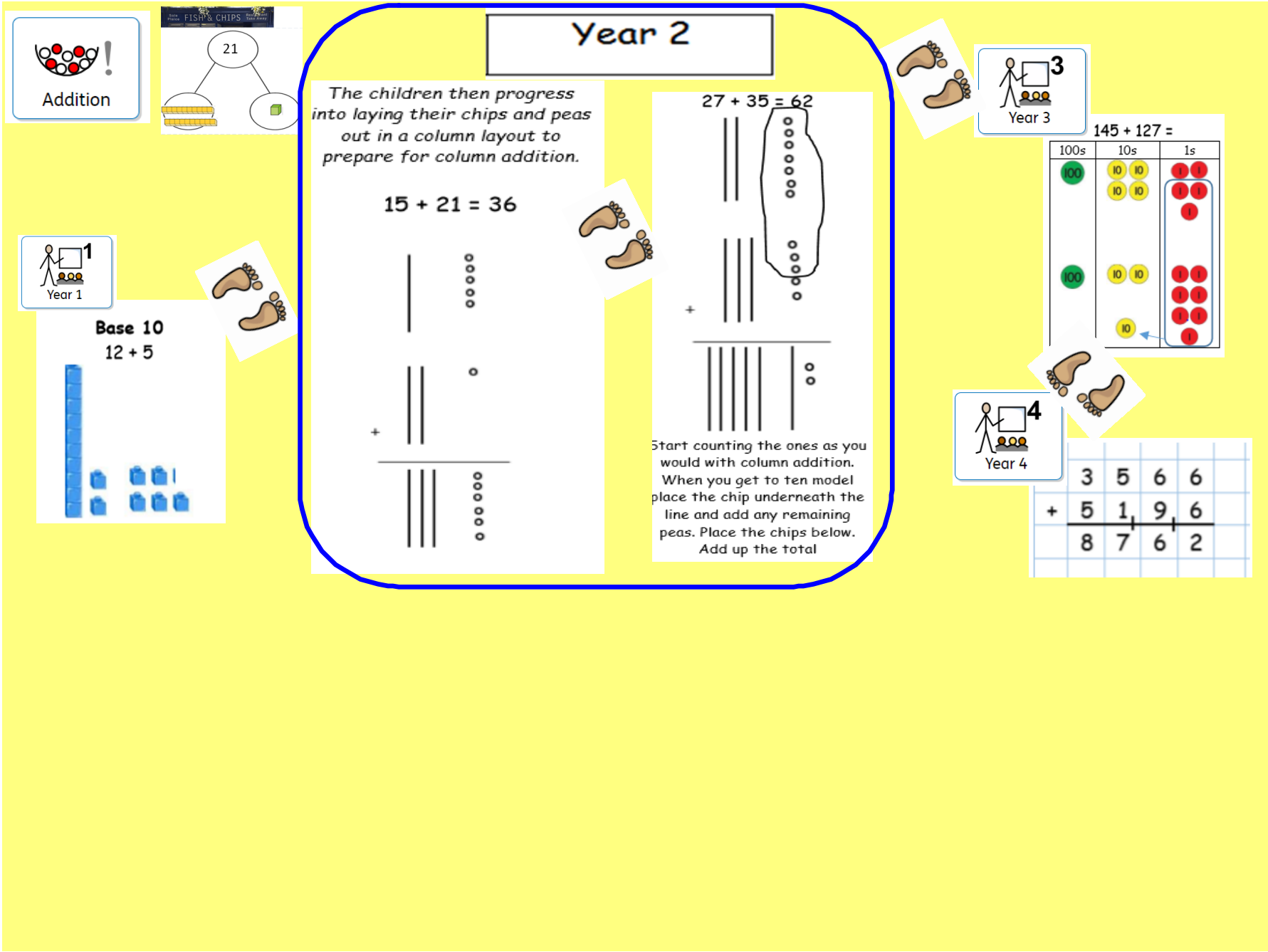
Whole - Part = Part

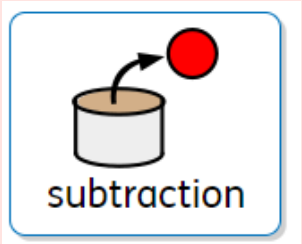
Year 1 Year 2

5 Complete the part-whole models.






Addition
21
Year 2
The children then progress into laying their chips and peas out in a column layout to prepare for column addition.
15 + 21 = 36
27 + 35 = 62
Start counting the ones as you would with column addition. When you get to ten model place the chip underneath the line and add any remaining peas. Place the chips below. Add up the total
Year 1
Base 10
12 + 5
Year 3
145 + 127 =
100s
10s
1s
Year 4
3 5 6 6
+ 5 1 9 6
8 7 6 2



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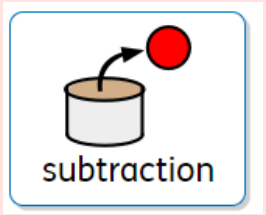
Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

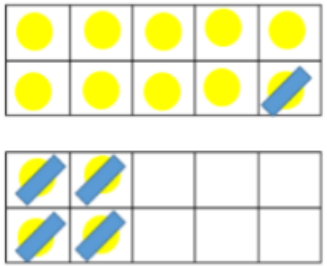


Year 1	Year 2

Finding Difference

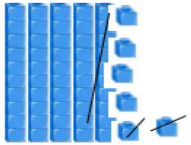
Tens Frames

14 - 5

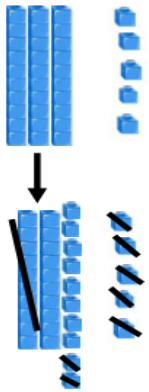


Base 10

56 - 12 =



35 - 17 =



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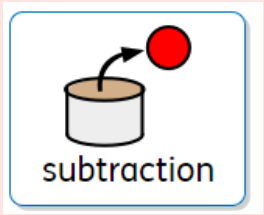

Year 1 Year 2

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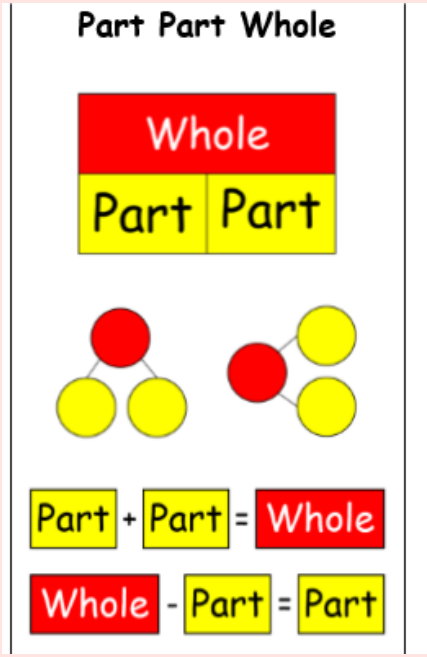
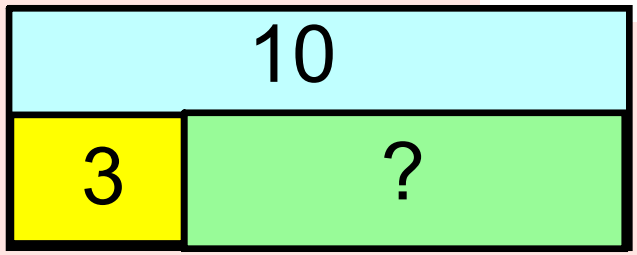


Year 1 Year 2



$3 + \square = 10$

$10 - 3 = \square$

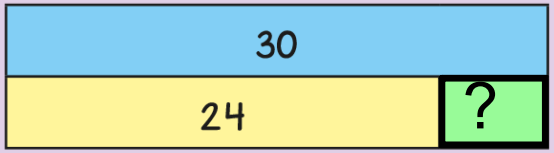
Tell me a number story to match the bar!

Addition

links

subtraction

2 Use the bar model to complete the number sentences.

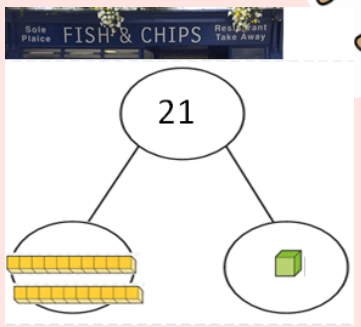


$\square + \square = 30$

$\square - \square = 24$

Write a a number story to match the bar!

1
Year 1 Place Value

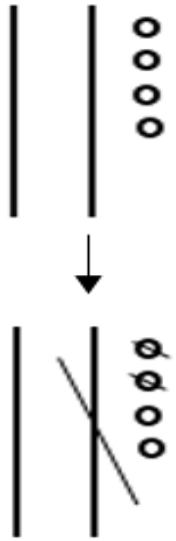


2
Year 2

subtraction

Chips and Peas

24 – 12 =



32 – 18 =

3
Year 3

		6	
	4	7	12
-	2	5	4
	2	1	8

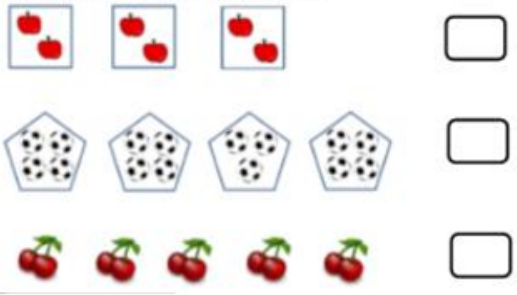
Year 1	Year 2
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Multiplication

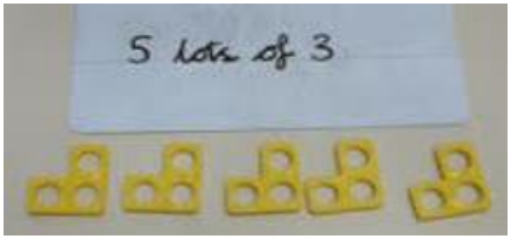
Year 1	Year 2
All Using 2s, 5s and 10 times tables	All Using 2s, 3s, 5s and 10 times tables

Identifying Equal Groups

Tick which pictures show equal groups



Numicon

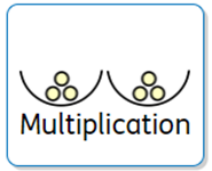


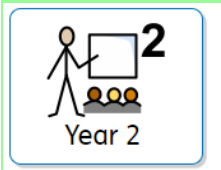
Multiplication

Year 1 Year 2

Repeated Addition Linked to Picture

2 + 2 + 2 = 6





Drawing Pictures

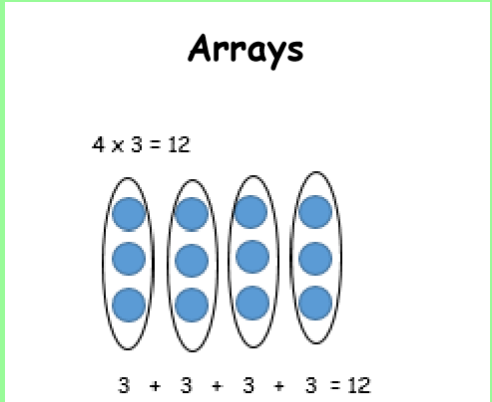
There were 5 ice cream cones. Each cone had 3 scoops of ice cream in.

How many scoops were there?

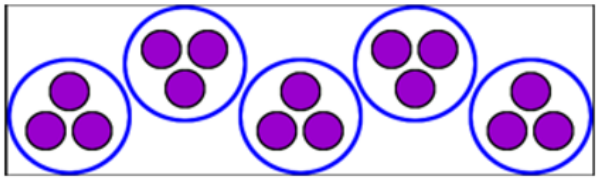
5 groups of 3

5 x 3 = 15

Arrays



Models and Images



There are ___ equal groups with ____ in each group. I have five ___.

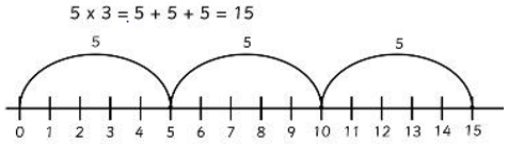
Bar Models

3 groups of 4.

4 + 4 + 4 = 12

3 x 4 = 12

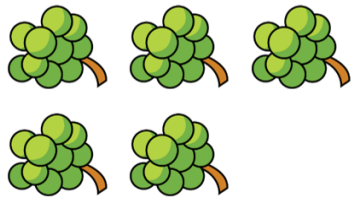
Repeated addition



Multiplication

Year 1	Year 2

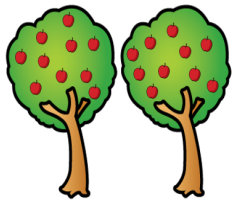
In a shop, grapes come in bunches of 10



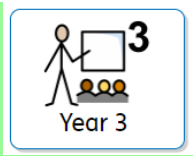
Max wants to buy forty grapes.

Are there enough grapes?

Spot the mistake.



Alex says, "There are 10 equal groups with 2 in each group. There are ten 2s."

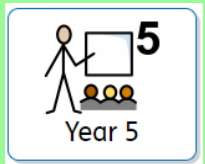


Place Value Counters

23 x 5 =

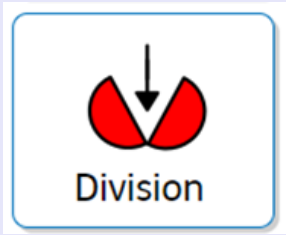
10s	1s
10 10	1 1 1
10 10	1 1 1
10 10	1 1 1
10 10	1 1 1
10 10	1 1 1

100 + 15 = 115



Expanded Multiplication

		5	9
x			8
		7	2
	4	0	0
	4	7	2



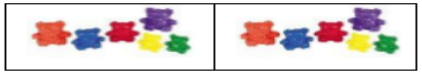
Year 1	Year 2
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

Division

Year 1 Year 2

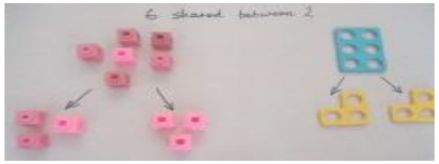
Halving

10 ÷ 2 = 5



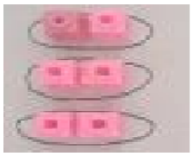
Sharing

6 ÷ 2 =



Grouping

6 ÷ 2

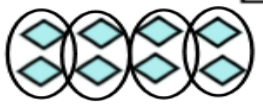


Sharing Objects

15 ÷ 3 = 5

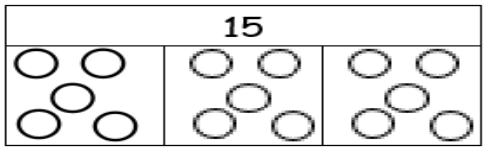
Grouping Objects

8 ÷ 2 = ☐



Bar Model

15 ÷ 3 =



Division

2
Year 2

Inverse

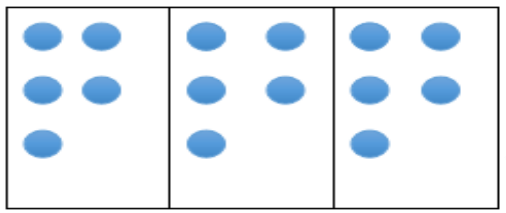
Use of times table knowledge and the inverse.

Eg. 5 x 4 = 20 so 20 ÷ 4 = 5

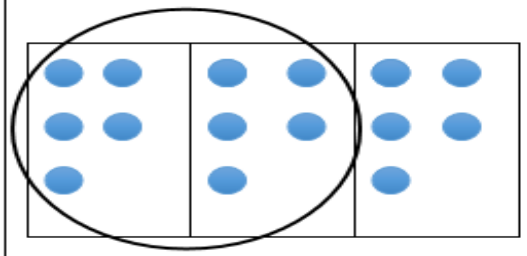
20 ÷ 5 = 4

Finding Fractions of Amounts

1/3 of 15 = 5



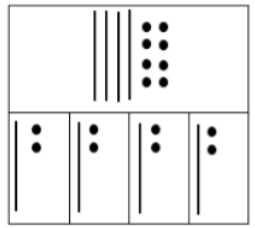
2/3 of 15 = 10



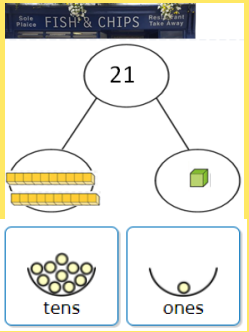
3
Year 3

Sharing (Bar Model)

48 ÷ 4 = 12



Vocabulary



Back in my day, they were units!

cm g
m^2 kg
units

value = one

Vocabulary

links

Year 1

10	
3	7

3 + 7 = 10

10 - 3 = 7

Whole

Part	Part

Year 6

1,000,000	
300,000	700,000

300,000 + 700,000 = 1,000,000

1,000,000 - 300,000 = 700,000

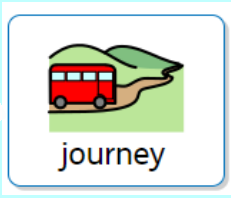
Recap!

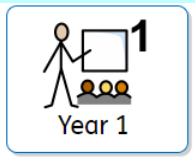
Why is progression in calculation important?

It gives the children the building blocks that they need to be successful in Mathematics and supports them to develop their calculation methods from EYFS to Year 6... and beyond!

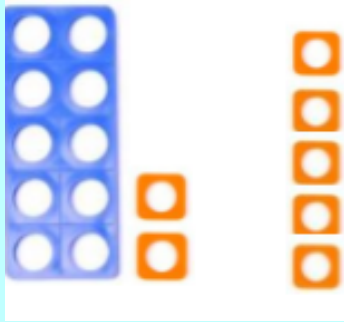
Recap!

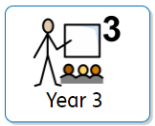
Why is progression in calculation important?





12 + 5

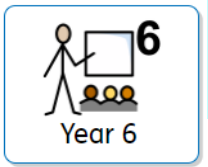


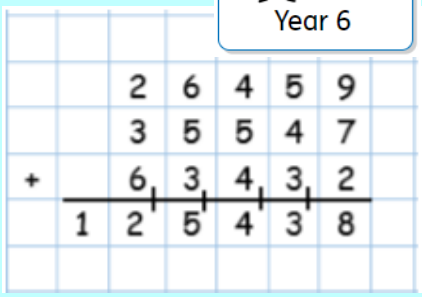


Place Value Counters

134 + 23 =

100s	10s	1s
100	10 10 10	1 1 1 1
	10 10	1 1 1





How can I continue to support my child/children with Maths calculation?

- Firstly, thank you - you are doing amazing job with supporting the children with their online/home learning!
- You can use the calculation KS1 progression document and follow the methods when supporting you children with Maths calculation.
- You can use the vocabulary on the KS1 calculation progression document when supporting your children.
- You can join our Maths lesson zooms to see the calculation methods that the children are learning that day!
- You can use the websites provided, that link to our calculation methods, if you want to do anymore Maths activities at home with your children!

https://whiterosemaths.com/

We use White Rose Maths to support our planning and teaching in all Year groups so the calculation methods, visuals and practical resources that you see on the activities and videos match those that we use in school.

I will post a document - KS1 calculation progression (with all of the key information from our zoom and slides and some more useful websites) on Seesaw for you to save or print!