ST. HELEN'S CATHOLIC INFANT SCHOOL

Maths: Calculation Policy

Written by	Date	Ratified by	Date
Ruth McCarthy	June 2023	Governors	June 2023

To be reviewed	Annually	Every 3 Years
Reviewed on	Reviewed by	Next review date
		June 2026

About Our Calculation Policy

The following calculation policy has been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school.

Age stage expectations

The calculation policy is organised according to age stage expectations as set out in the National Curriculum 2014, however it is vital that pupils are taught according to the stage that they are currently working at, being moved on to the next level as soon as they are ready, or working at a lower stage until they are secure enough to move on.

Providing a context for calculation

It is important that calculations are given a real life context or problem solving approach to help build children's understanding of the purpose of calculation and to help them recognise when to use certain operations when faced with problems.

Choosing a calculation method:

Children need to be taught and encouraged to use the following processes in deciding what approach they will take to a calculation, to ensure they select the most appropriate method for the numbers involved:

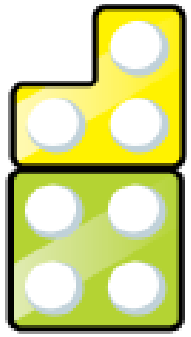
To work out a tricky calculation:

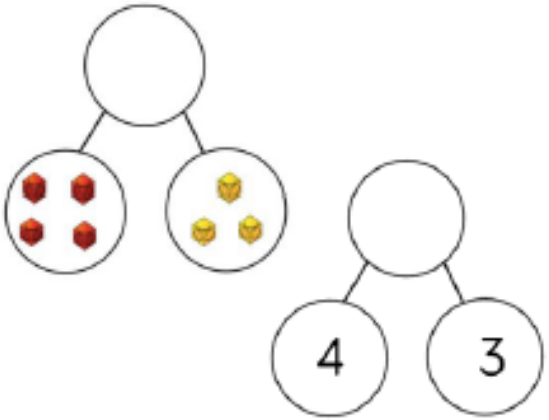
Can I solve it in my head using a mental strategy?
Do I need to use manipulatives to help me solve it? (concrete)
Could I use some jottings to help me? (pictorial)
Should I use a written method to work it out?

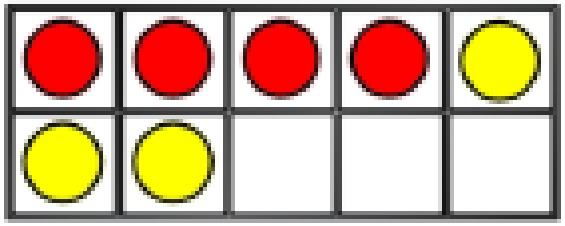
EYFS Addition

Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

Cardinality, counting, comparison and composition







EYFS

- Children can explore numbers within 10 using Numicon.
- Children begin to combine groups of objects using concrete objects both mathematical and found.
- Children are encouraged to read number sentences aloud in different ways. “ Three add two equals 5, 5 is equal to three add two”
- Children record in pictures, words or symbols of addition activities already carried out.
- They solve simple problems using fingers.
- Number tracks are introduced.
- Number lines can then be used alongside number tracks and practical apparatus to solve addition calculations and word problems.
- Part part whole models and tens frames are used to support partitioning.

Addition

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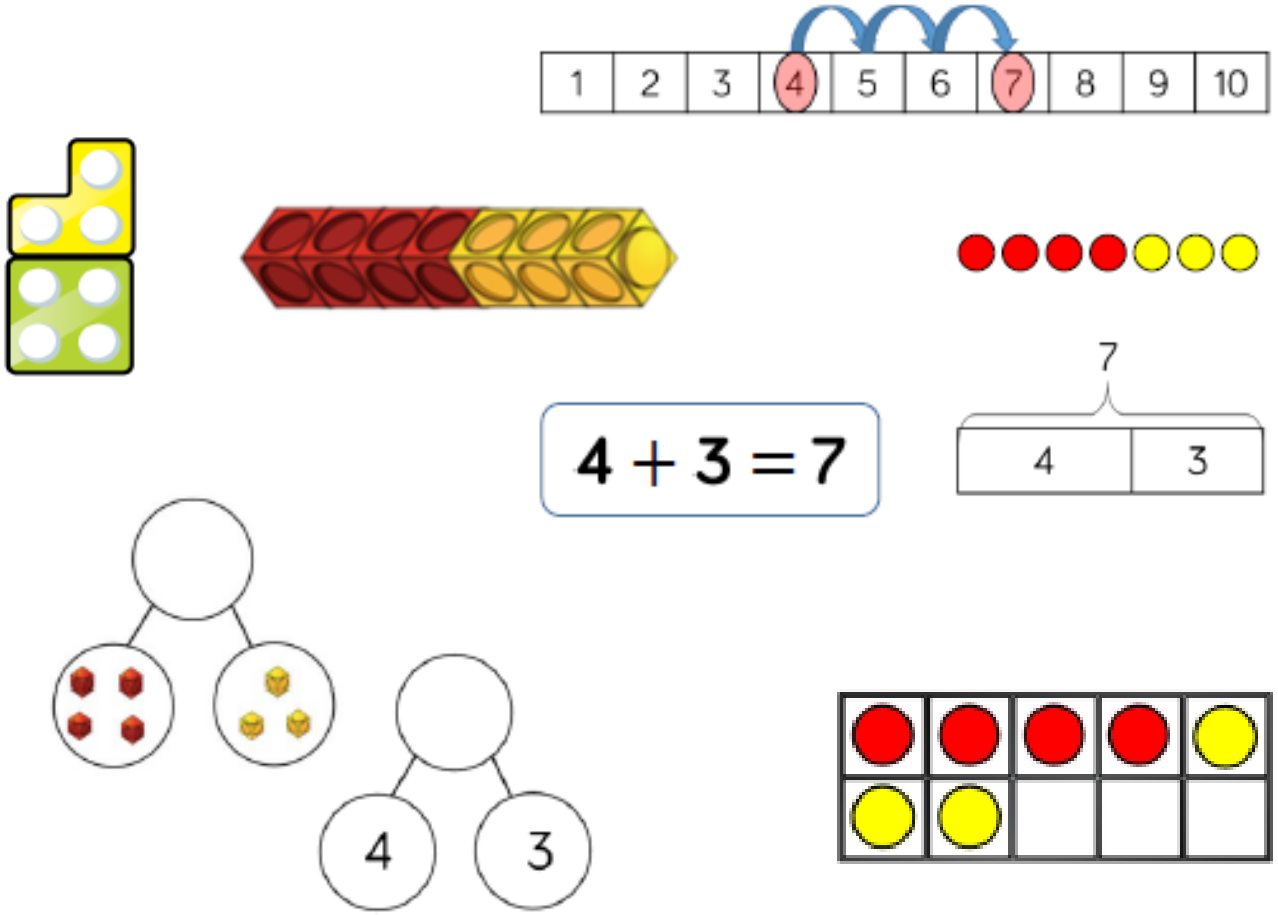
Skill: Add 1-digit numbers within 10	Year 1



- When adding numbers to 10 children can explore both aggregation and augmentation.
- The part-whole model, number shapes and ten frame support aggregation.
- The bar model, ten frame and number track all support augmentation.

Addition

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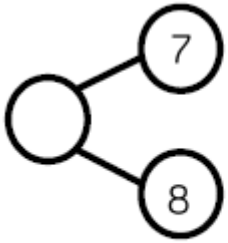
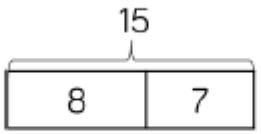
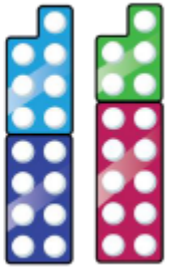
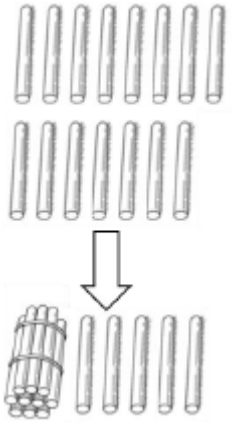
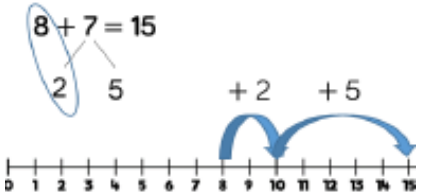
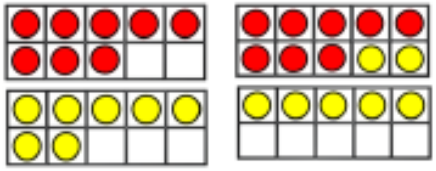
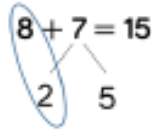
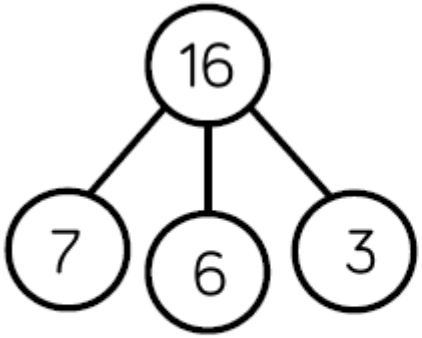
Where possible, concepts should be taught in the context of real life.

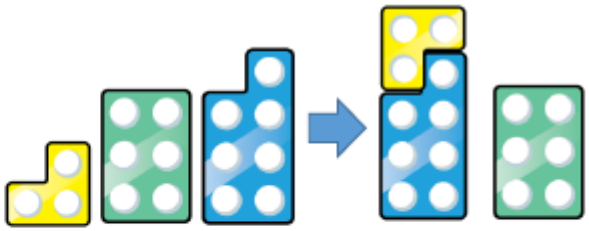
Skill: Add 1 and 2 digit numbers within 20	Year 1
    $8 + 7 = 15$   	• When adding 1 digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. • Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

Addition

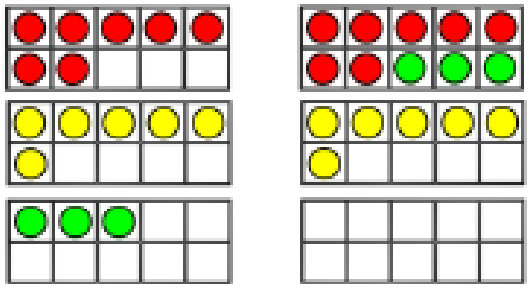
Maths for young children should be meaningful.
Where possible, concepts should be taught in the context of real life.

Skill: Add 3 one digit numbers.





$7 + 6 + 3 = 16$



$7 + 6 + 3 = 16$

10

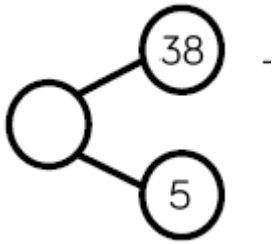
Year 2

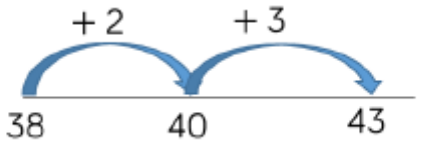
- When adding three 1 digit numbers children should be encouraged to look for number bonds, near bonds or doubles to add the numbers more efficiently.
- This supports understanding of commutativity.
- Manipulatives that support number bonds to 10 are effective when adding three 1 digit numbers.

Addition

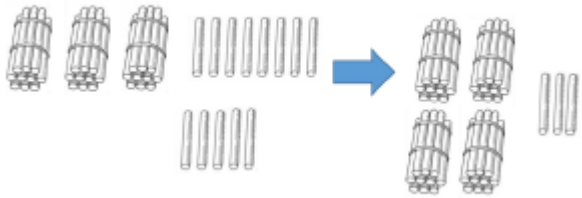
Maths for young children should be meaningful.
Where possible, concepts should be taught in the context of real life.

Skill: Add 1 and 2 digit numbers to 100





$$38 + 5 = 43$$



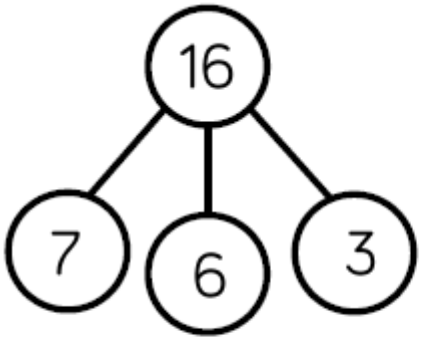
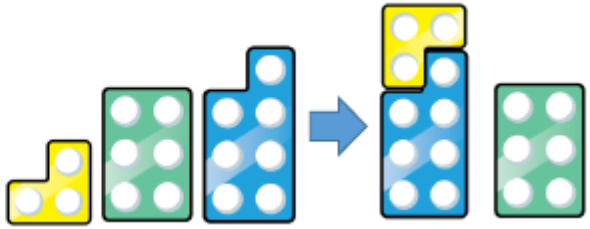
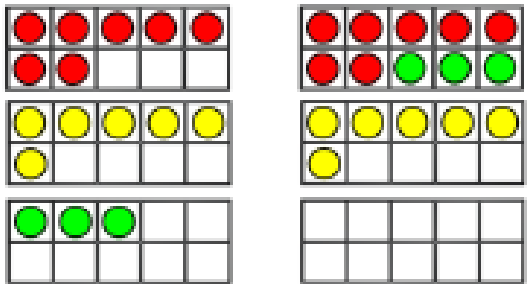
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Year 2

- When adding single digits to a two digit number children should be encouraged to count on from the larger number.
- They should also apply their knowledge of number bonds to add more efficiently E.g. 8+5=13 so 38 +5 = 43
- Hundred squares and straws can support children to find the number bonds to 10.

Addition

Maths for young children should be meaningful.
Where possible, concepts should be taught in the context of real life.

Skill: Add 3 one digit numbers.	Year 2
  $7 + 6 + 3 = 16$  $7 + 6 + 3 = 16$ 10	• When adding three 1 digit numbers children should be encouraged to look for number bonds, near bonds or doubles to add the numbers more efficiently. • This supports understanding of commutativity. • Manipulatives that support number bonds to 10 are effective when adding three 1 digit numbers.

Addition

Maths for young children should be meaningful.
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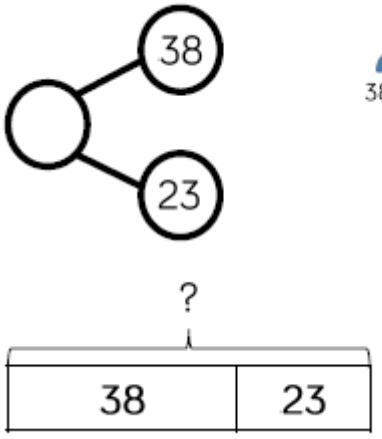
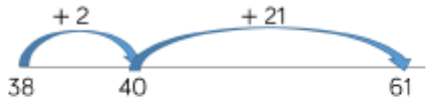
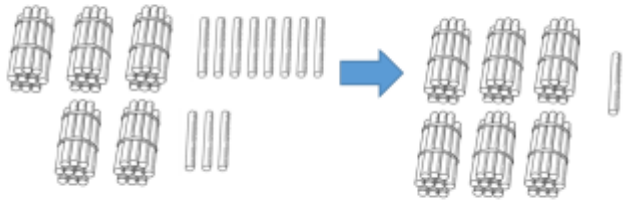
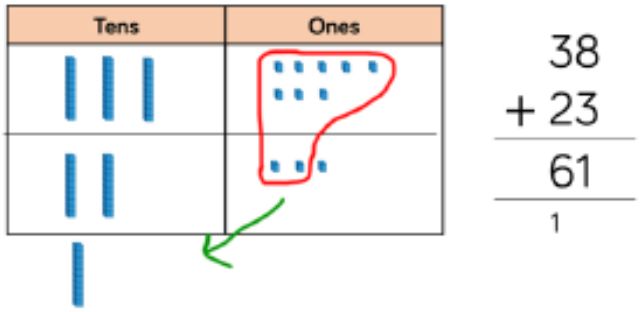
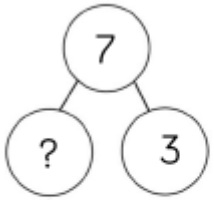
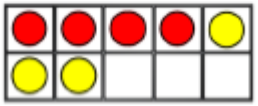
Skill: Add two 2 digit numbers to 100	Year 2
   $38 + 23 = 61$  38 + 23 61 1	• Children are encouraged to use the formal column method when calculating alongside straws or base 10. As numbers becoe larger straws become less efficient. • Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

EYFS Subtraction

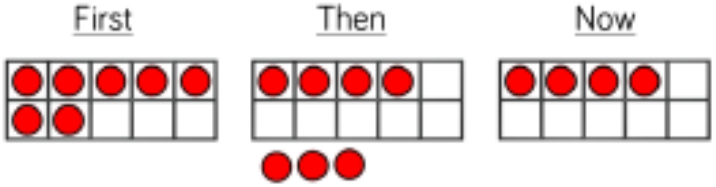
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

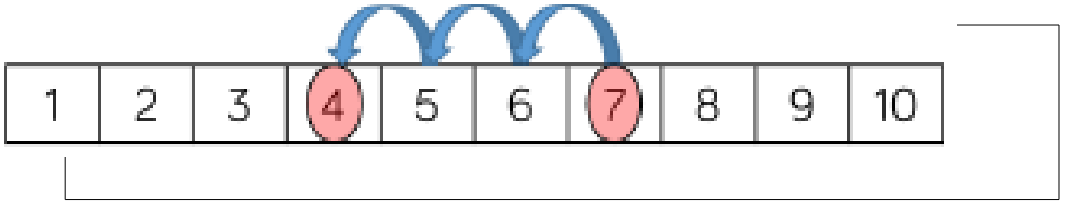
Cardinality, counting, comparison and composition





$7 - 3 = 4$





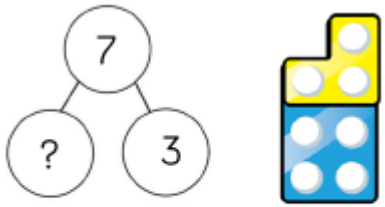
EYFS

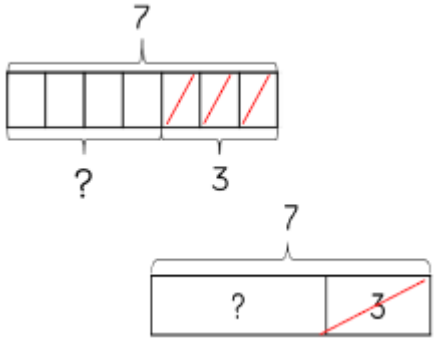
- Children begin with mostly pictorial representation.
- Concrete apparatus is used to relate subtraction to taking away and how many objects are left.
- Construct number sentences verbally or using cards to go with practical activities.
- Children are encouraged to read number sentences aloud in different ways. “Five subtract one leaves four. Four is equal to five subtract one.”
- Children make a record in pictures, words or symbols of subtraction activities already carried out.
- Solve simple problems using fingers.
- Number tracks can be introduced to count back and find 1 less.
- Number lines can then be used alongside number tracks and practical apparatus to solve subtraction calculations and word problems. Children count back under the number line.
- Part part whole models and tens frames are used to support partitioning.

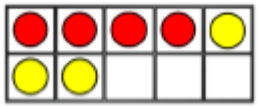
Subtraction

Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

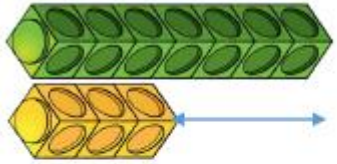
Skill: Subtract 1 digit numbers within 10

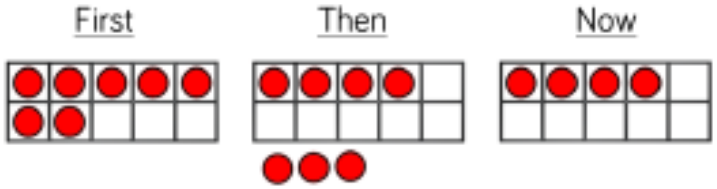


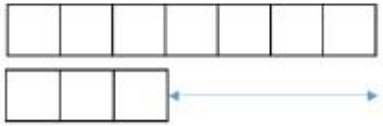


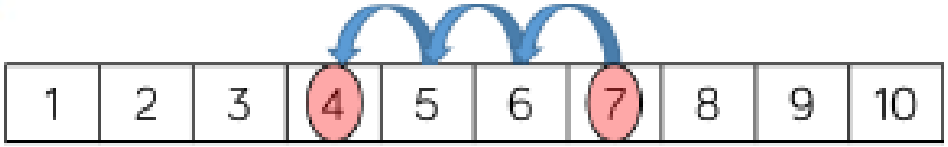


$7 - 3 = 4$









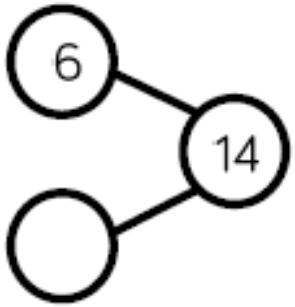
Year 1

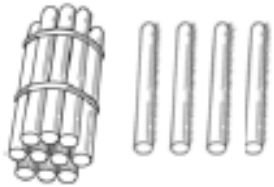
- Part whole models, tens frames, bar models and number shapes support partitioning.
- Tens frames, number tracks, and single bar models support reduction.
- Cubes and bar models with two bars can support finding the difference.

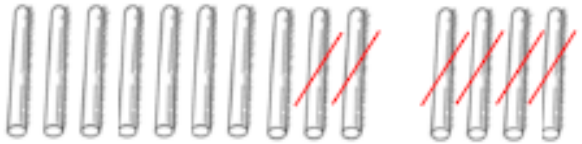
Subtraction

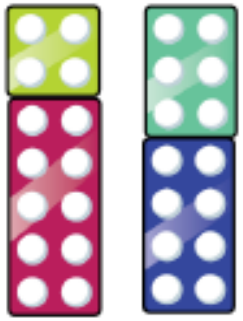
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

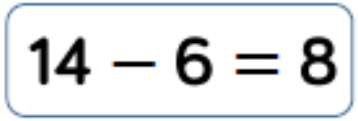
Skill: Subtract 1 and 2 digit numbers to 20

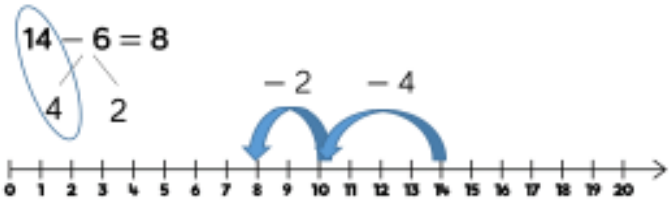


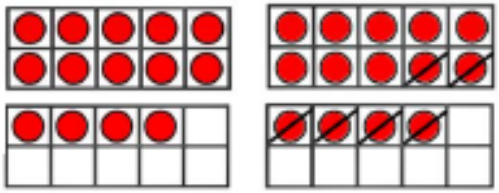


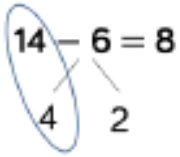












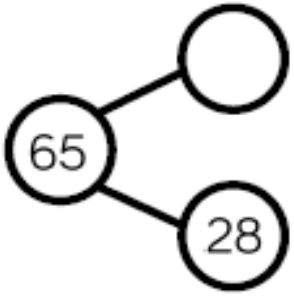
Year 1 and 2

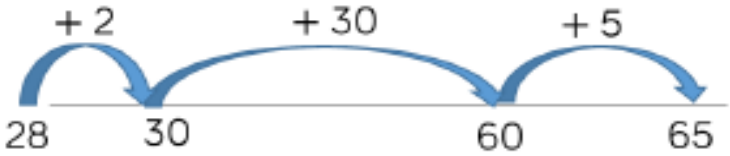
- When subtracting one digit numbers that cross 10 it is important to highlight the importance of ten ones equalling one ten.
- Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

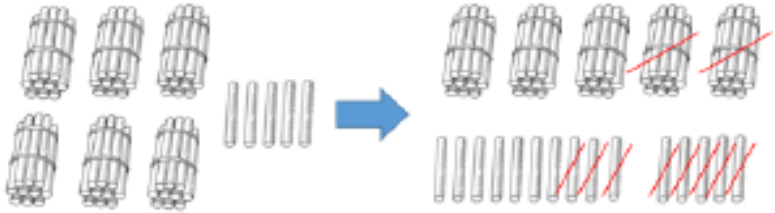
Subtraction

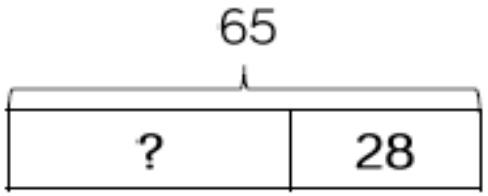
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

Skill: Subtract 1 and 2 digit numbers to 100

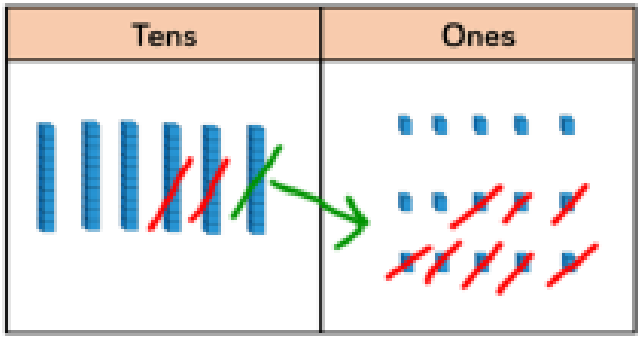








$$65 - 28 = 37$$



$$\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 28 \\ \hline 37 \end{array}$$

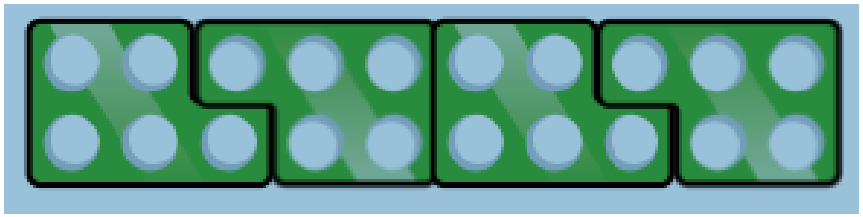
Year 2

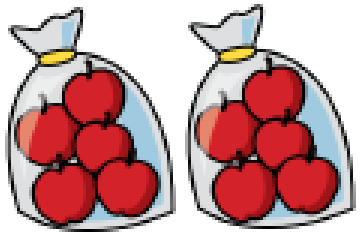
- At this stage encourage children to use the formal column method when calculating alongside straws and base 10. As numbers become larger, straws become less efficient.
- Children can also use a blank number line to count on to find the difference. Encourage them to jump in multiples of 10 to become more efficient.

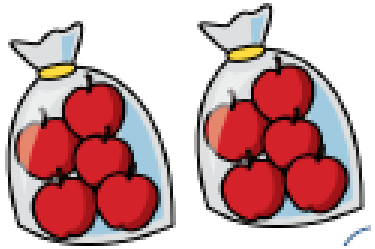
EYFS Multiplication

Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

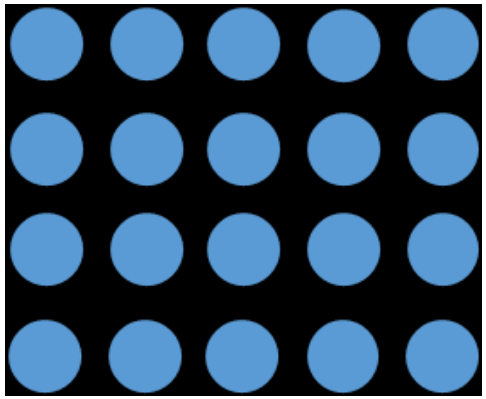
Cardinality, counting, comparison and composition







One bag holds 5 apples.
How many apples do 4 bags hold?



$5 + 5 + 5 + 5 = 20$

EYFS

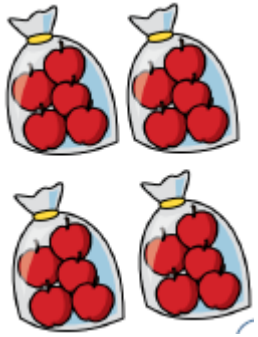
- The link between addition and multiplication can be introduced through doubling.
- Numicon is used to visualise the repeated addition of the same number
- Children begin with mostly pictorial representation
- Real life contexts and use of practical equipment to count in repeated groups of the same size.
- Children are given multiplication problems set in a real life context. Children are encouraged to visualise the problem

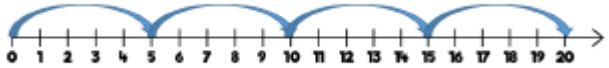
How many fingers on one hand? How many sides on three triangles? How many legs on four ducks? etc

Multiplication

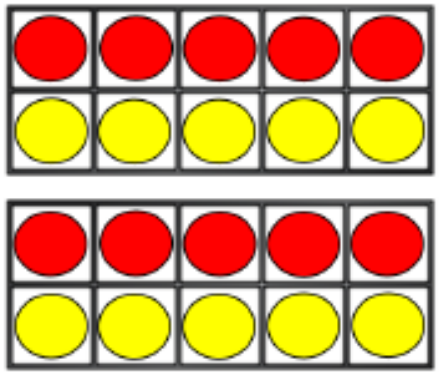
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

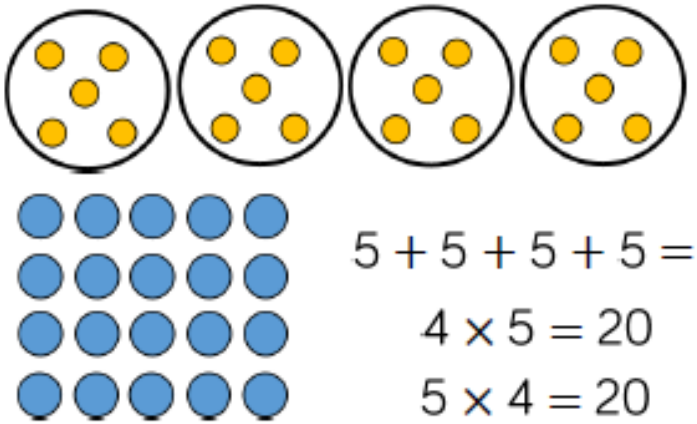
Skill: Solve one step problems using multiplication





One bag holds 5 apples.
How many apples do 4 bags hold?





$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

$5 \times 4 = 20$

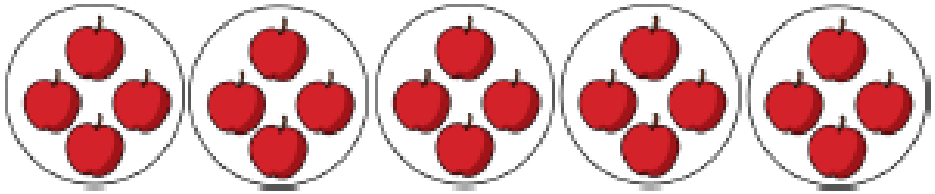
Year 1 and 2

- Children represent multiplication as repeated addition in many different ways.
- In Year 1 children use concrete and pictorial representation to solve problems. They are not expected to record multiplication formally.

In Year 2 children are introduced to the multiplication symbol.

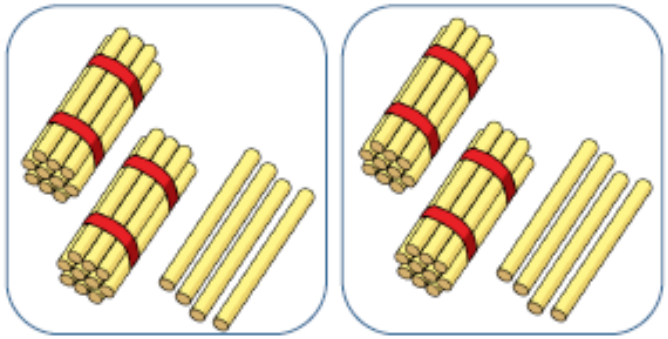
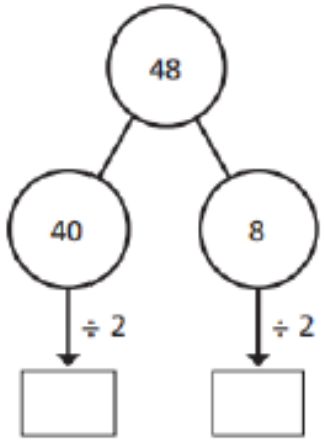
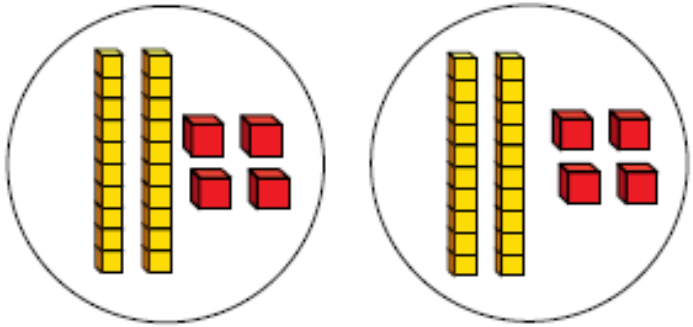
EYFS Division

Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

Cardinality, counting, comparison and composition	EYFS
There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag? 	• Children solve problems including doubling, halving and sharing • Children need to see and hear representations of division as both grouping and sharing. • Division can be introduced through halving. • Children begin with mostly pictorial representation. • Children have a go at recording the calculations that has been carried out.

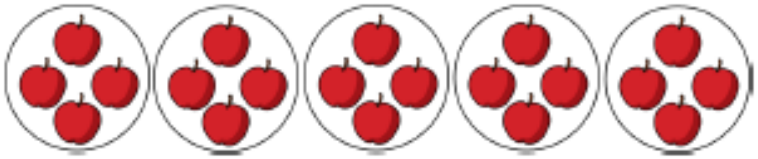
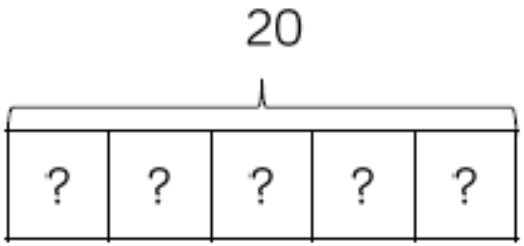
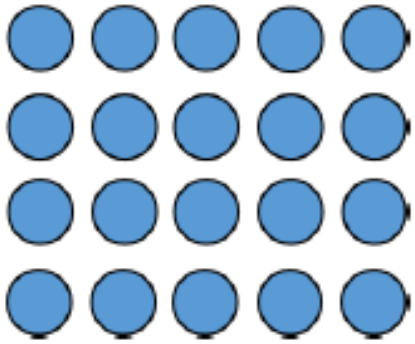
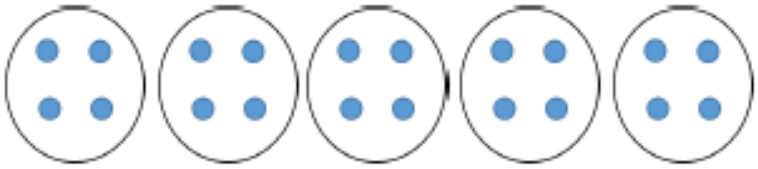
Division

Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

Skill: Divide 2 digits by 1 digit (sharing with no exchange).	**Year 1 and 2**
  48 ÷ 2 = 24 	• When dividing larger numbers children can use manipulatives that allow them to partition into tens and ones. • Straws and base ten can be used to share numbers into equal groups. • Part whole models can provide children with a clear written method that matches the concrete representation.

Division

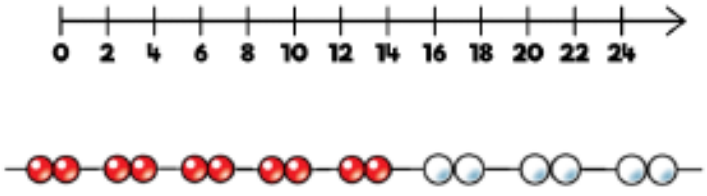
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.

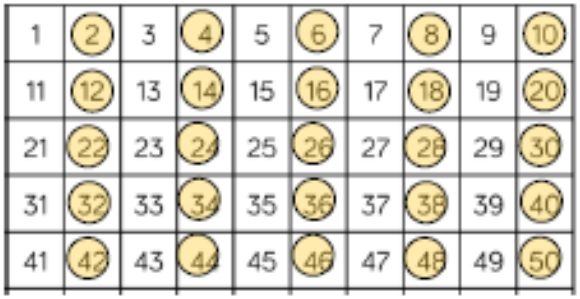
Skill: Solve one step problems using sharing.	Year 1 and 2
  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?   $20 \div 5 = 4$	• Children solve problems by sharing amounts into equal groups. • In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. • In Year 2, children are introduced to the division symbol.

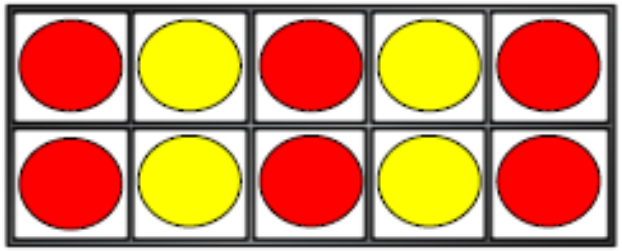
Multiplication

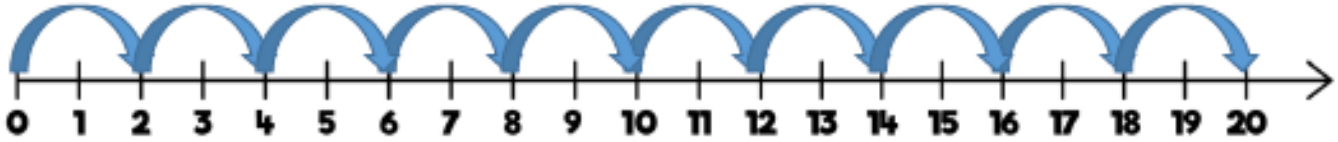
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life

Skill: 2 times table









Year 2

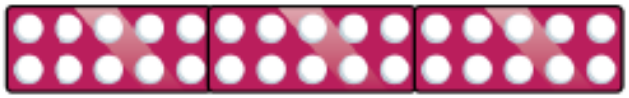
- Encourage daily counting in multiples both forward and backwards. This can be supported using a number line or a hundred square.
- Look for patterns in the two times tables, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency.

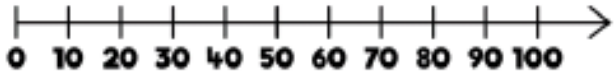
Multiplication

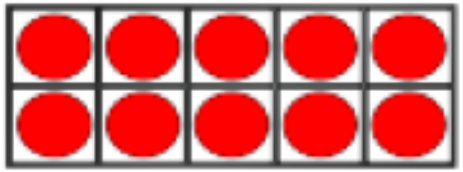
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life

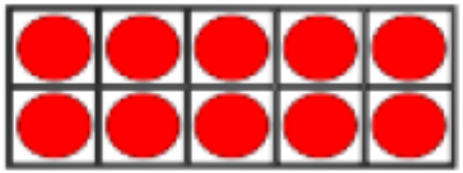
Skill: 10 times table

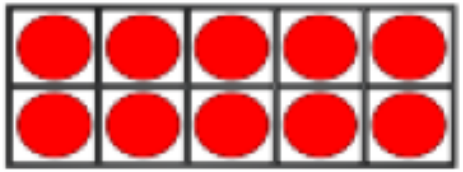
Year 2











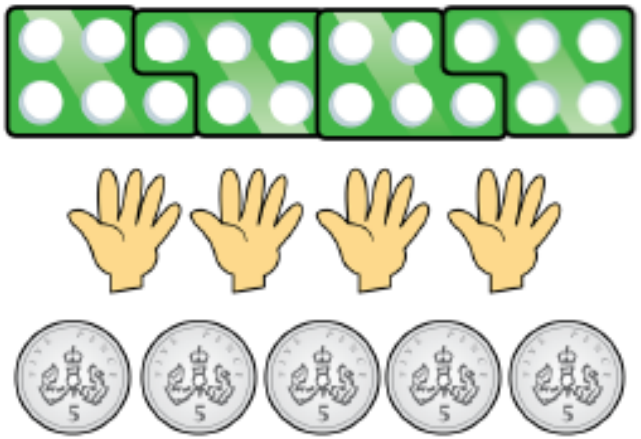
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

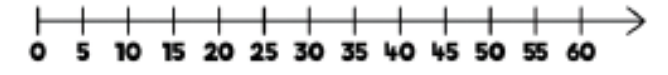
- Encourage daily counting in multiples both forward and backwards. This can be supported using a number line or a hundred square.
- Look for patterns in the ten times tables, using concrete manipulatives to support. Notice the pattern in the digits-the ones are always 0 and the tens increase by 1 each time.
- Use different models to develop fluency.

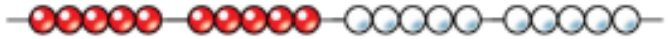
Multiplication

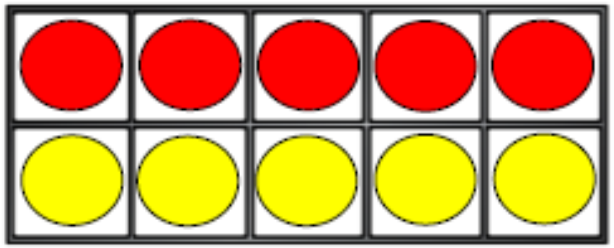
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life

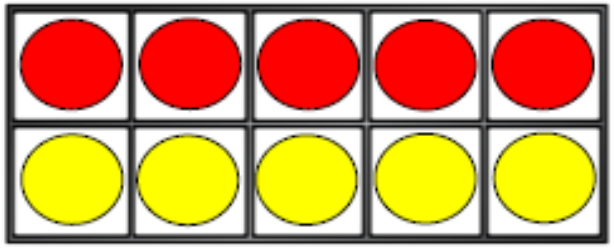
Skill: 5 times table



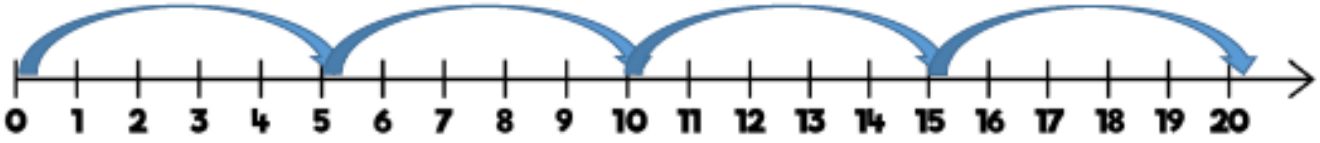








1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



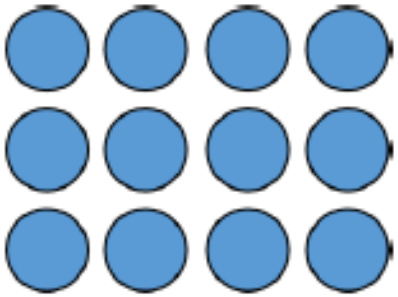
Year 2

- Encourage daily counting in multiples both forward and backwards. This can be supported using a number line or a hundred square.
- Look for patterns in the five times tables, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd , even pattern.
- Use different models to develop fluency.

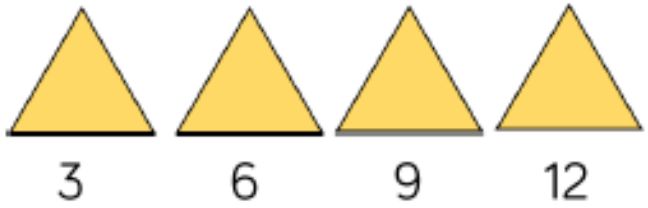
Multiplication

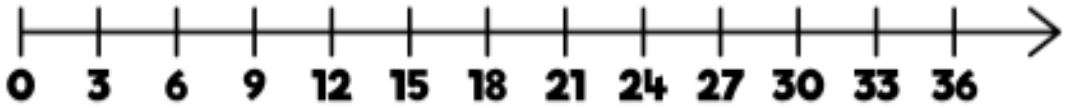
Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life

Skill: 3 times table



1	2	(3)	4	5	(6)	7	8	(9)	10
11	(12)	13	14	(15)	16	17	(18)	19	20
(21)	22	23	(24)	25	26	(27)	28	29	(30)
31	32	(33)	34	35	(36)	37	38	39	40
41	42	43	44	45	46	47	48	49	50





Year 2

- Encourage daily counting in multiples both forward and backwards. This can be supported using a number line or a hundred square.
- Look for patterns in the three times tables, using concrete manipulatives to support. Notice the odd, even, odd, even pattern.
- Highlight the pattern in ones using the 100 square.
- Use different models to develop fluency.

Glossary

Addend A number to be added to another.
Aggregation Combining 2 or more quantities or measures to find a total.
Array an ordered collection of counters, cubes or other item in rows and columns.
Augmentation Increasing a quantity or measure by another quantity.
Commutative Numbers can be added or multiplied in any order.
Difference The numerical difference between two numbers is found by comparing the quantity in each group.
Exchange Change a number or expression for another of an equal value.
Factor A number that multiplies with another to make a product.
Partitioning Splitting a number into its component parts.
Product The result of multiplying one number by another.
Subitise Instanstly recognise the number of objects in a small group without needing to count.
Sum The result of addition.
Total The aggregate or the sum found by addition.