

Maths at St.Martin's Catholic Primary

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

At St. Martin's we follow a Mastery approach to help us to achieve these aims.

The key features of a mastery approach:

The class work together on the same topic

The emphasis is on keeping the class together until specific concepts or skills are mastered and then moving on together. This does **not** mean that some children will be left behind or others not challenged. Differentiation is now achieved through and deeper understanding, as explained below.

Speedy teacher intervention to prevent gaps

Those children that have not met the expected outcomes or have gaps in their understanding, will be helped by receiving short, immediate extra time on maths, during the lesson or later in the day. This is a positive opportunity to consolidate their understanding.

Challenge is provided by going deeper not accelerating

For those children that have mastered the skill, concept or procedure they will be presented with higher order thinking activities, rather than accelerating through the curriculum.

Focused, rigorous and thorough teaching

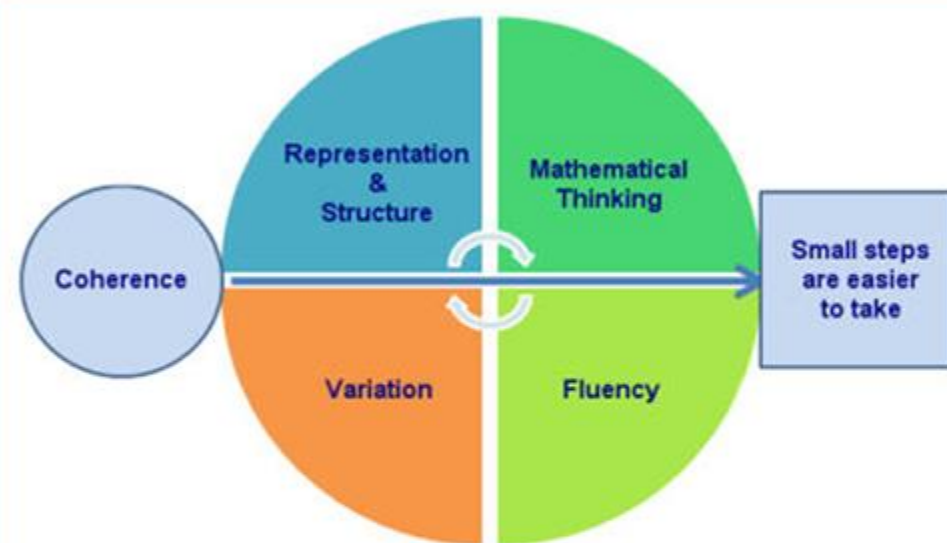
Within Mastery, the idea is to focus on one small step at a time in a lesson, with an emphasis on the mathematical structures involved and the best way to represent these through models and images. Each small step is important as it builds towards deep understanding of a concept.

More time on teaching topics – depth and practice

The same topic is likely to have the same focus until the class has mastered the concept, skill or procedure being taught. This is particularly the case for number and calculations. Focus areas are being taught over a longer time with smaller steps of progress and time is for practice and depth, making the learning effective.

Representation and Structure
Representations such as objects and pictures are used in lessons expose the mathematical concepts being taught.

Mathematical Thinking
If taught ideas are to be understood deeply, they must not merely be passively received but must be thought about, reasoned with and discussed with others.



Variation
Varying the way a concept is initially presented to students, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practice questions so that mechanical repetition is avoided, and thinking is encouraged.

Fluency
Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

Coherence
Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning, all steps being small steps.

You will see in our daily maths lessons:

Fluency, reasoning and problem solving.

In EYFS, KS1 and Year 3 are using the Mastering Number KS1 Program.

Learners are supported and challenged in lessons through questioning, resources and being challenged to think creatively about a problem.

Concrete manipulatives and pictorial representations are used to support conceptual understanding and to make links across topics.

Websites you can use to help your children at home:

<https://nrich.maths.org/parents>

<https://www.bbc.co.uk/bitesize>

<https://www.primaryhomeworkhelp.co.uk/maths/index.html>

<https://www.cgpbbooks.co.uk/resources/cgp-s-free-online-10-minute-tests>

<https://www.educationquizzes.com/in/primary/>

<https://mathsbot.com/>

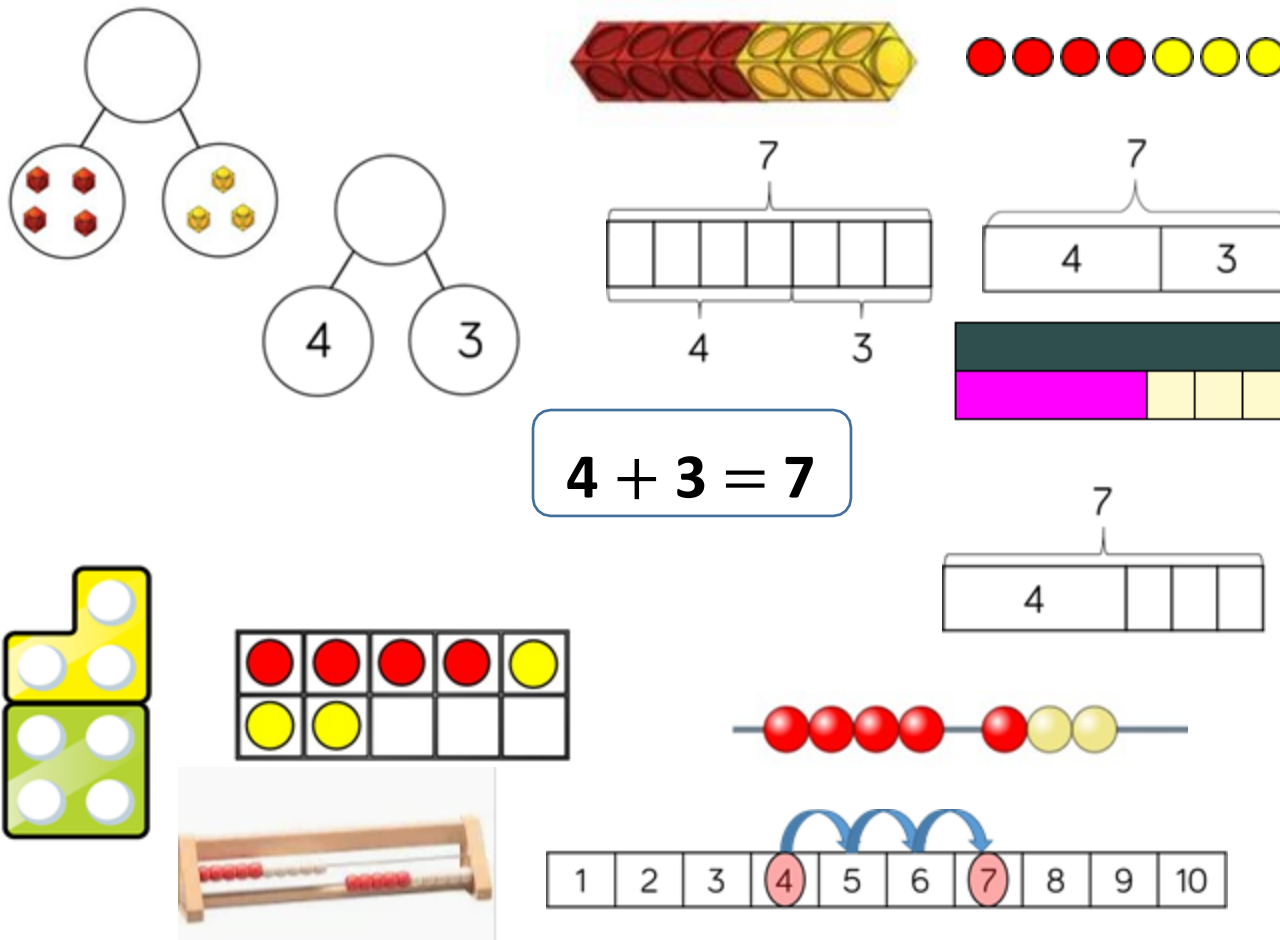
<https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-at-home/>

<https://www.topmarks.co.uk/maths-games/5-7-years/counting>

**YEAR 1 and
YEAR 2**

Skill: Add 1-digit numbers within 10

Year: 1



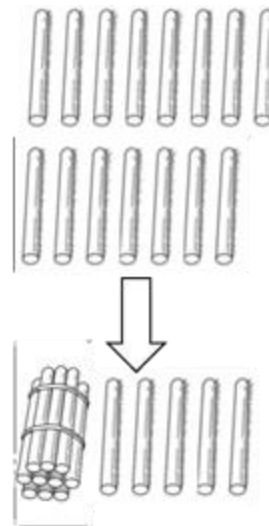
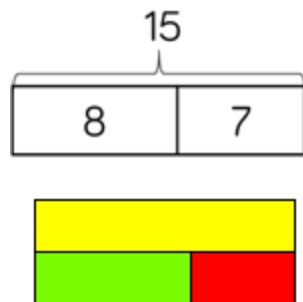
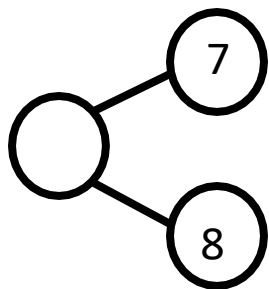
When adding numbers to 10, children can explore both aggregation and augmentation.

The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.

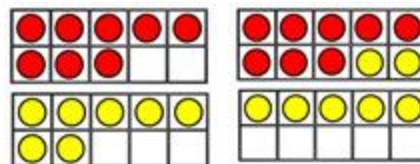
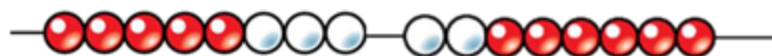
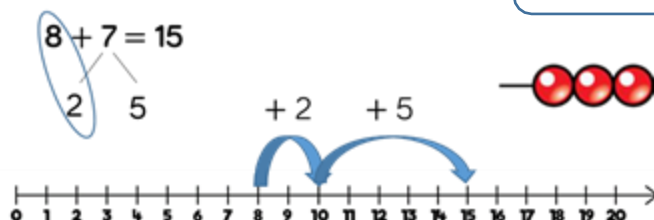
The combination bar model, ten frame, bead string and number track all support augmentation.

Skill: Add 1 and 2-digit numbers to 20

Year: 1/2



$$8 + 7 = 15$$

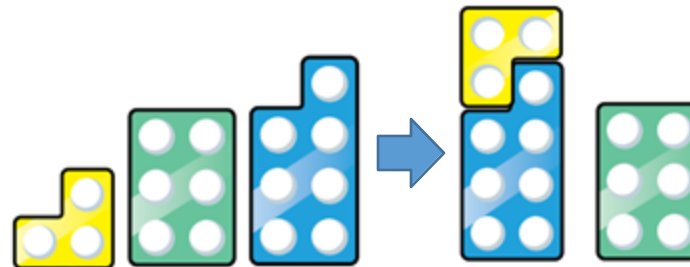
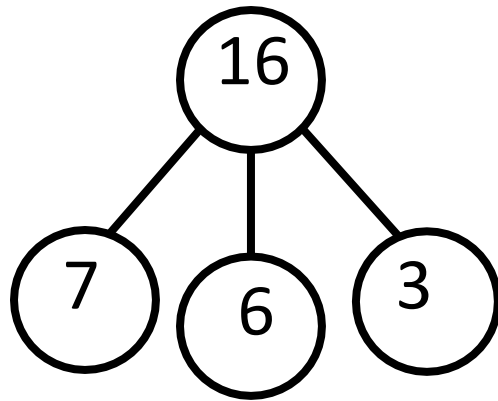


$$8 + 7 = 15$$

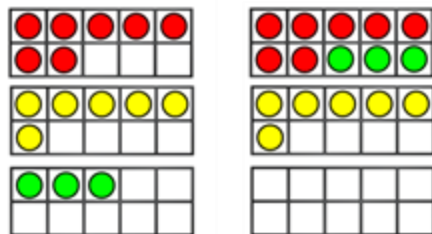
When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on. From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps.

Skill: Add three 1-digit numbers

Year: 2

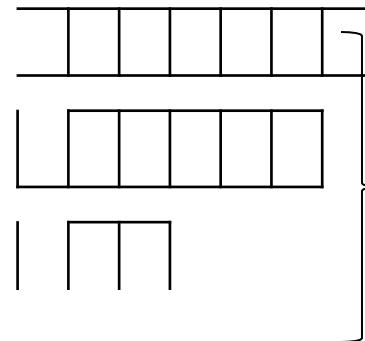


$$7 + 6 + 3 = 16$$



$$7 + 6 + 3 = 16$$

10



16

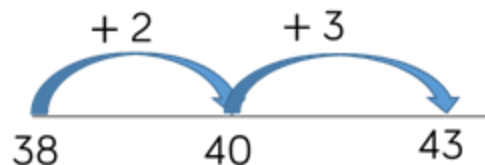
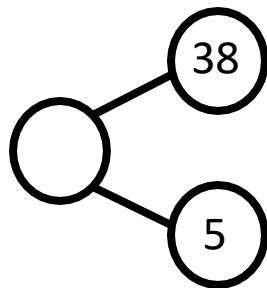
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

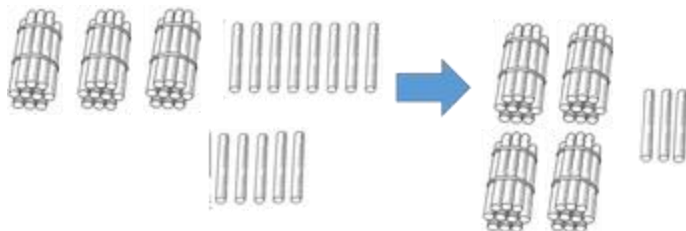
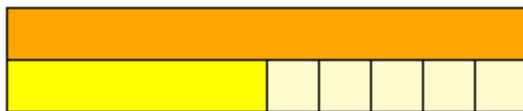
Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

Skill: Add 1-digit and 2-digit numbers to 100

Year: 2/3



$$38 + 5 = 43$$



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

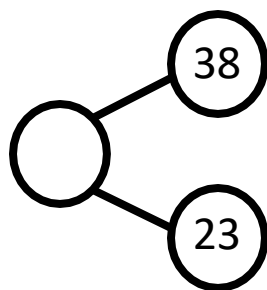
When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

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 bond to 10.

Skill: Add two 2-digit numbers to 100

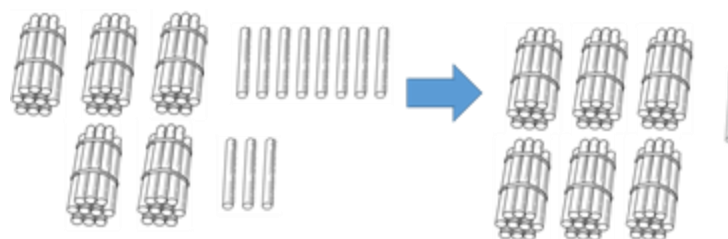
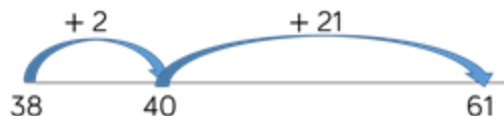
Year: 2/3



38	23
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Tens	Ones



$$38 + 23 = 61$$

$$\begin{array}{r} 38 \\ + 23 \\ \hline 61 \\ 1 \end{array}$$

Tens	Ones
10 10 10	1 1 1 1 1 1 1 1
10 10	1 1 1

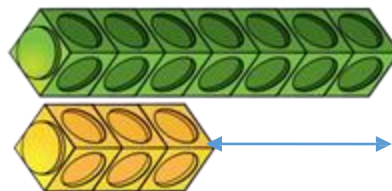
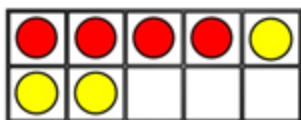
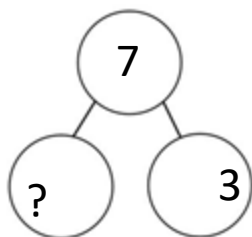
Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become

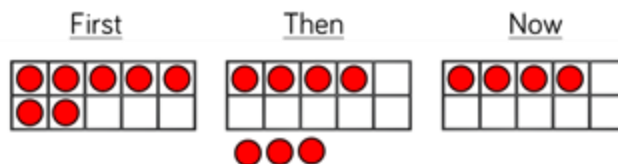
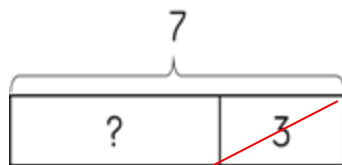
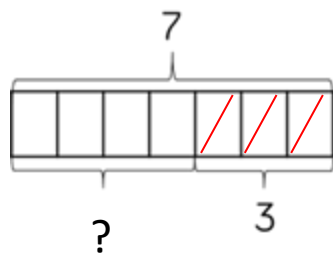
larger, straws become less efficient.

Skill: Subtract 1-digit numbers within 10

Year: 1



$$7 - 3 = 4$$



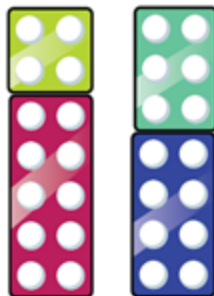
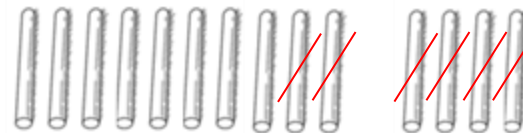
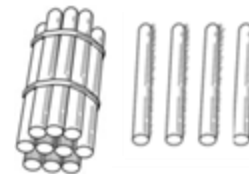
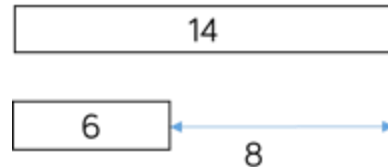
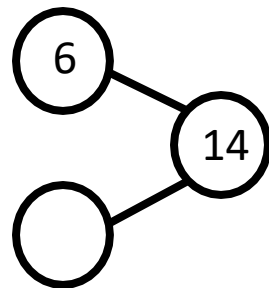
Part-whole models, bar models, ten frames and number shapes support partitioning.

Ten frames, number tracks, single bar models and bead strings support reduction.

Cubes and bar models with two bars can support finding the difference.

Skill: Subtract 1 and 2-digit numbers to 20

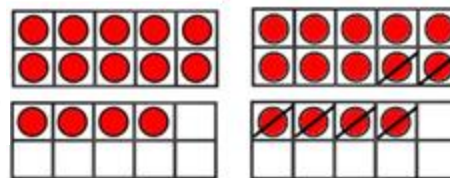
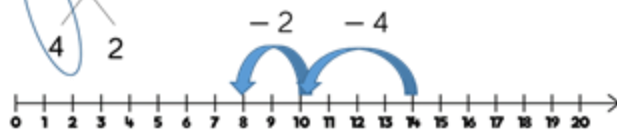
Year: 1/2



$$14 - 6 = 8$$



$$14 - 6 = 8$$

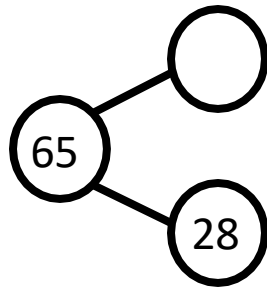


$$14 - 6 = 8$$

In Year 1, subtracting one-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines. From Year 2, 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.

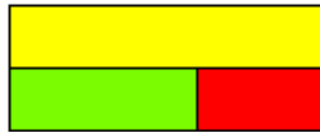
Skill: Subtract 1 and 2-digit numbers to 100

Year: 2/3



65

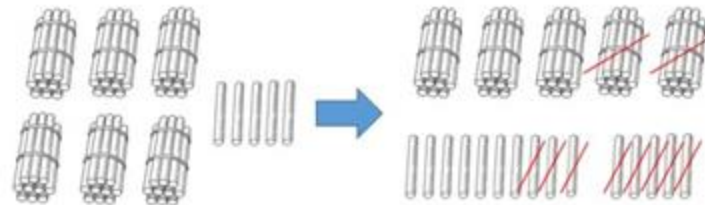
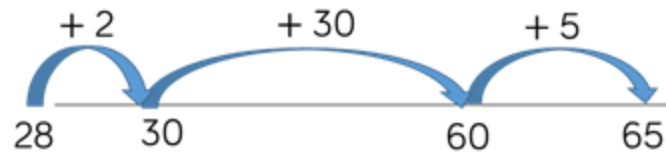
?	28
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Tens	Ones

$$\begin{array}{r} 5 \overset{1}{6}5 \\ - 28 \\ \hline 37 \end{array}$$

Tens	Ones

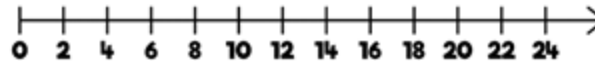
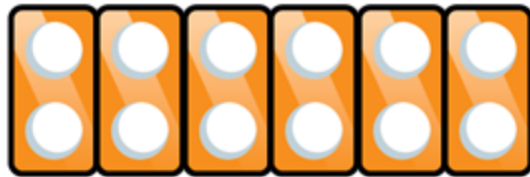


$$65 - 28 = 37$$

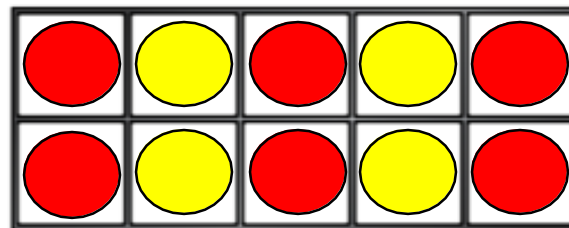
Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Skill: 2 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



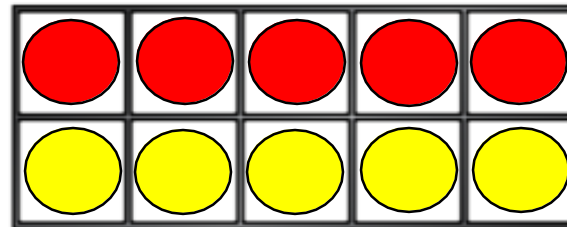
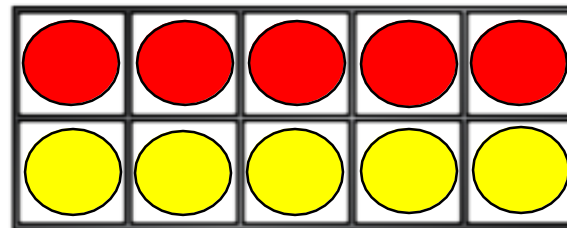
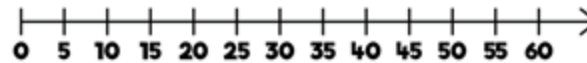
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.

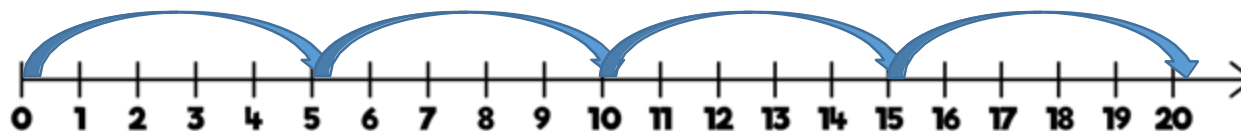
Use different models to develop fluency.

Skill: 5 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

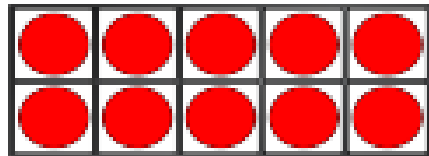
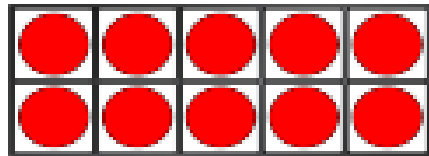
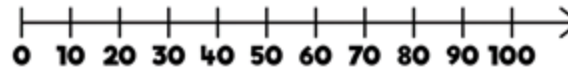


Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

Skill: 10 times table

Year: 2



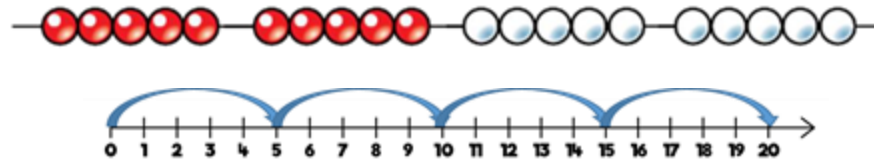
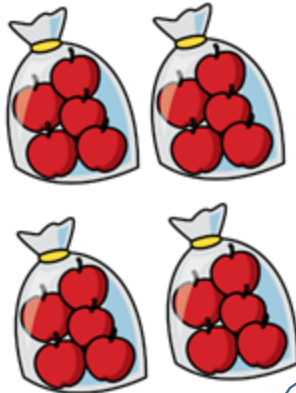
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

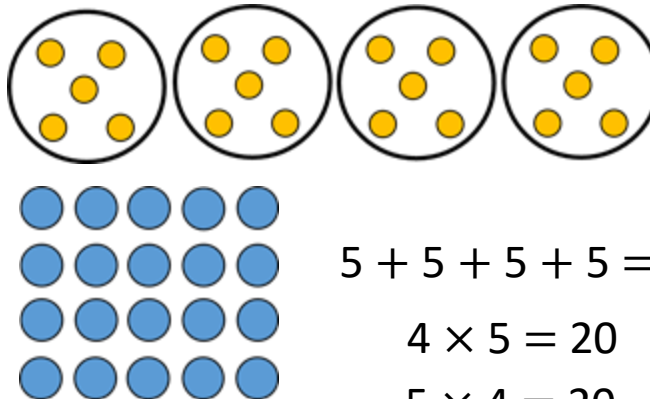
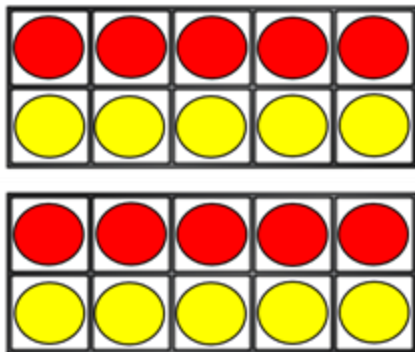
Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time.

Skill: Solve 1-step problems using multiplication

Year: 1/2



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



$$5 + 5 + 5 + 5 = 20$$

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

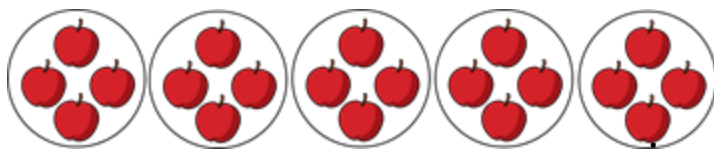
Children represent multiplication as repeated addition in many different ways.

In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.

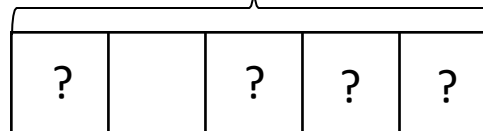
In Year 2, children are introduced to the multiplication symbol.

Skill: Solve 1-step problems using multiplication (sharing)

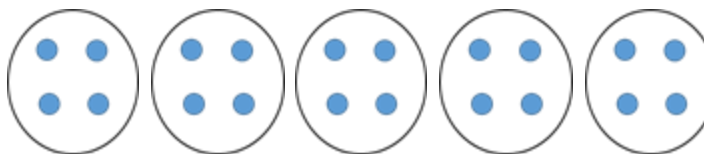
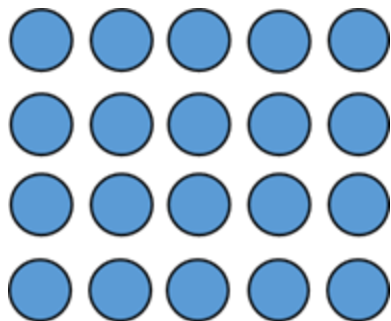
Year: 1/2



20



There are 20 apples altogether.
They are shared equally between 5 bags.
How many apples are in each bag?



$$20 \div 5 = 4$$

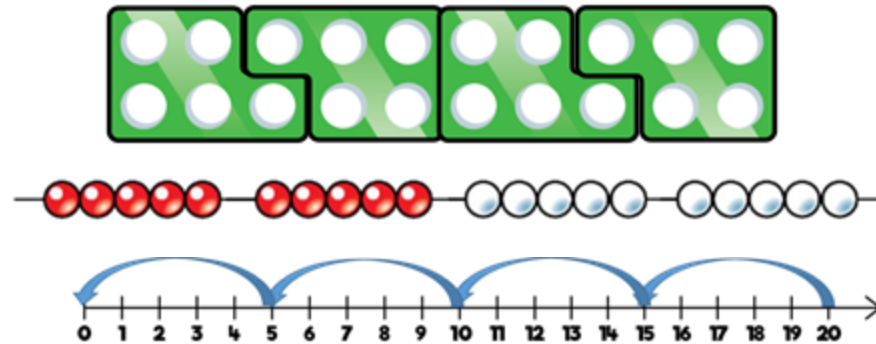
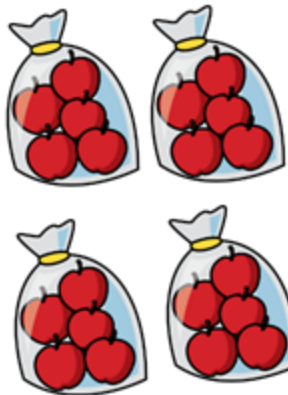
Children solve problems by sharing amounts into equal groups.

In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.

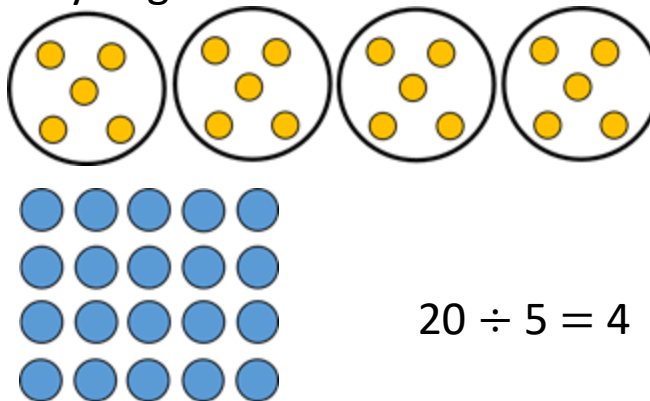
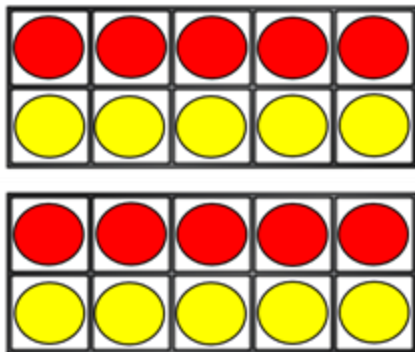
In Year 2, children are introduced to the division symbol.

Skill: Solve 1-step problems using division (grouping)

Year: 1/2



There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?



$$20 \div 5 = 4$$

Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Glossary

Addend - A number to be added to another.

Aggregation - combining two or more quantities or measures to find a total.

Augmentation - increasing a quantity or measure by another quantity.

Commutative – numbers can be added in any order.

Complement – in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

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.

Minuend – A quantity or number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend - A number to be subtracted from another.

Sum - The result of an addition.

Total – The aggregate or the sum found by addition.

Glossary

Array – An ordered collection of counters, cubes or other item in rows and columns.

Commutative – Numbers can be multiplied in any order.

Dividend – In division, the number that is divided.

Divisor – In division, the number by which another is divided.

Exchange – Change a number or expression for another of an equal value.

Factor – A number that multiplies with another to make a product.

Multiplicand – In multiplication, a number to be multiplied by another.

Partitioning – Splitting a number into its component parts.

Product – The result of multiplying one number by another.

Quotient – The result of a division

Remainder – The amount left over after a division when the divisor is not a factor of the dividend.

Scaling – Enlarging or reducing a number by a given amount, called the scale factor