Helping my Child with Maths

Calculation Methods
Key Stage 1

Introduction

The information in this booklet is to help your child with maths.

It explains some of the different strategies used for mental and written calculations in school.

It gives a wide variety of ways of helping your child at home.
It also includes a selection of websites, which your child may enjoy.

The aims of this booklet is to provide you with a greater understanding of how mathematics is taught in school and to show you progression of the four operation methods through Key Stage 1.

The New Curriculum

New Expectations

By the end of year 1 pupils should
- count to and across 100 from any number.
- use number bonds and subtraction facts within 20.

By the end of year 2 pupils should
- know the 2, 5, and 10 times tables.
- make comparisons using the < > = symbols.

There is also an emphasis placed on Fractions
- recognising 1/2, 1/4 (Yr 1)
- recognising 3/4, 1/3 (Yr 2)

1, 2, 3 ......

- Numbers are as vital to maths as letters are to English.

- The importance of learning to count is undeniable.

- The key to developing a sound understanding is learning exactly where a number fits in relation to any other.

- Children need to learn how our number system works: that you can count backwards, forwards and in steps of multiples.

Addition (+)

add
plus
make
total
sum
more
addition
altogether

Subtraction (−)

difference between
subtract
leave
minus
less
take away

Equals (=)

balance
same as
equals

Division (÷)

divided by
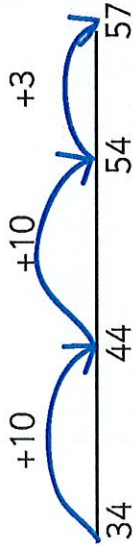share
divided into
divided
equal groups of
share equally
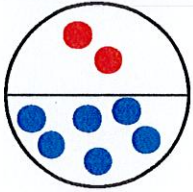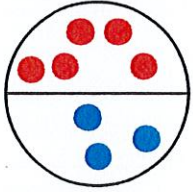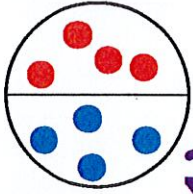
Multiplication (×)

multiplication
times
multiply
groups of
multiple of
lots of
multiplied by
repeated additon

−

counting down in 1's

$5 - 3 =$

Sarah had 10 balloons.
6 were popped.
How many were left?

counting on

$+1$ $+1$ $+1$ $+10$ $+10$
23 24 25 26 27 37 47

counting back

-1 -1 -10 -10
24 25 26 27 37 47

÷

sharing

12 sweets shared between 3 people...

grouping

There are 6 sweets, how many people can have 2 sweets each?

repeated subtraction

$12 \div 3 =$

0 1 2 3 4 5 6 7 8 9 10 11 12

+

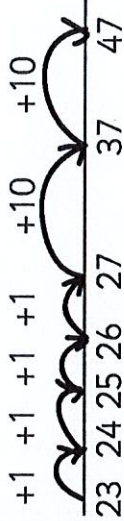## groups
make 8

counting in 1's

number line

$34 + 23 =$

$+10$ $+10$ $+3$
34 44 54 57

T U
T U

$22 + 13$

×
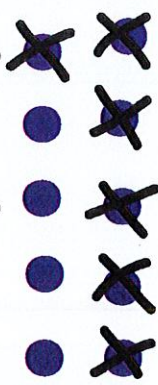
repeated addition

3 times 5 is 5+5+5 or 3 lots of 5 or 5x3

5 5 5
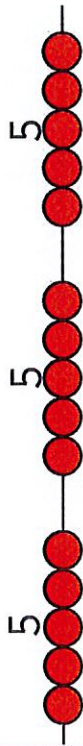
equal groups

3 lots of 5

array

$3 \times 5 = 15$

$5 \times 3 = 15$

Addition

Mental Addition
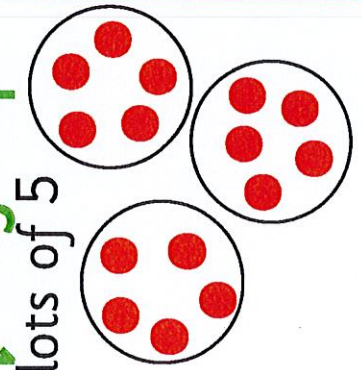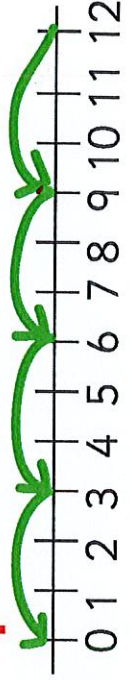
Year 1	Year 2
Using place value	**Using place value**
Count in 1s	Know 1 more or 10 more than any number
e.g. *45 + 1*	e.g. *1 more than 67*
Count in 10s	e.g. *10 more than 85*
e.g. *45 + 10 without counting on in 1s*	Partitioning
	e.g. *55 + 37 as 50 + 30 and 5 + 7, then finally combine the two totals: 80 + 12*

Year 1 place value grid:

34	35	36
44	🕷	46
54	55	56

Year 2 partitioning diagram:

$55 + 37$

$50 + 30 = 80$

$5 + 7 = 12$

92

Year 1 — Using place value (continued)

Add 10 to any given 2-digit number

Counting on

Count on in 1s

e.g. *8 + 3 as 8, 9, 10, 11*

8, 9, 10, 11 ...

Add, putting the larger number first

Count on in 10s

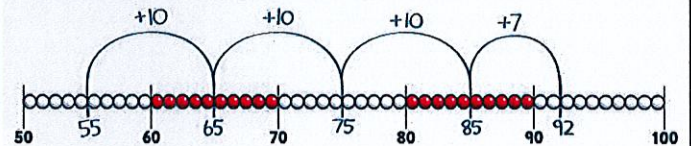e.g. *45 + 20 as 45, 55, 65*
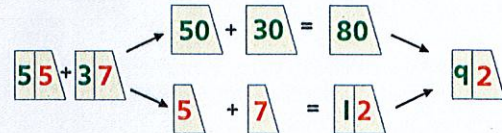
Year 2 — Counting on

Add 10 and multiples of 10 to a given 1- or 2-digit number

e.g. *76 + 20 as 76, 86, 96 or in one hop: 76 + 20 = 96*

Add two 2-digit numbers by counting on in 10s, then in 1s

e.g. *55 + 37 as 55 + 30 (85) + 7 = 92*

Number line: +10 +10 +10 +7

50 55 60 65 70 75 80 85 90 92 100

Add near multiples of 10

e.g. *46 + 19*

e.g. *63 + 21*

Mental Addition

Year 1	Year 2
Using number facts	**Using number facts**
'Story' of 4, 5, 6, 7, 8 and 9	Know pairs of numbers which make the numbers up to and including 12
e.g. *7 = 7 + 0, 6 + 1, 5 + 2, 4 + 3*	e.g. *8 = 4 + 4, 3 + 5, 2 + 6, 1 + 7, 0 + 8*
Number bonds to 10	e.g. *10 = 5 + 5, 4 + 6, 3 + 7, 2 + 8, 1 + 9, 0 + 10*
e.g. *5 + 5, 6 + 2, 7 + 3, 8 + 2, 9 + 1, 10 + 0*	Use patterns based on known facts when adding
	e.g. *6 + 3 = 9, so we know 36 + 3 = 39, 66 + 3 = 69, 56 + 3 = 59*

Year 1 (continued)
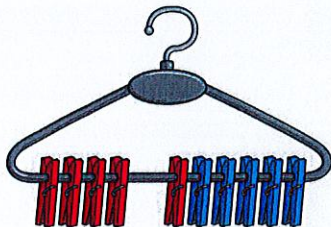
4 + 6 = 10

Use patterns based on known facts when adding

e.g. *4 + 3 = 7 so we know 24 + 3, 44 + 3, 74 + 3*

Year 2 (continued)

Bridging 10

e.g. *57 + 5 = 57 + 3 (60) + 2 = 62*

Number line: +3 +2

50 57 60 62 70
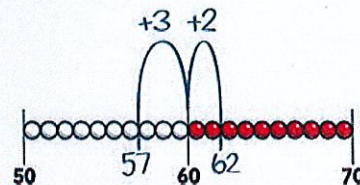
Add three or more 1-digit numbers, spotting bonds to 10 or doubles

e.g. *3 + 5 + 3 = 6 + 5 = 11*

e.g. *8 + 2 + 4 = 10 + 4 = 14*

Subtraction

Year 1	Year 2

Mental Subtraction

Using place value
Count back in Is
  e.g. *Know 53 – I*
Count back in 10s
  e.g. *Know 53 – 10 without counting back in Is*

32	33	34
42	43	44
52		54

Taking away
Count back in Is
  e.g. *II – 3 as II, 10, 9, 8*
  e.g. *14 – 3 as 14, 13, 12, II*

> *14, 13, 12, II*

Count back in 10s
  e.g. *53 – 20 as 53, 43, 33*

Using place value
Know I less or 10 less than any number
  e.g. *I less than 74*
  e.g. *10 less than 82*
Partitioning
  e.g. *55 – 32 as 50 – 30 and 5 – 2 and combine the answers: 20 + 3*

$$50 - 30 = 20$$
$$5 5 - 3 2$$
$$5 - 2 = 3$$
$$2 3$$
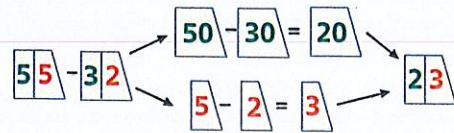
Taking away
Subtract 10 and multiples of 10
  e.g. *76 – 20 as 76, 66, 56 or in one hop: 76 – 20 = 56*
Subtract two 2-digit numbers by counting back in 10s, then in Is
  e.g. *67 – 34 as 67 subtract 30 (37) then count back 4 (33)*

$$-4 \qquad -30$$
30   33   37   40   50   60   67   70

Subtract near multiples of 10
  e.g. *74 – 21*
  e.g. *57 – 19*

Year 1	Year 2

Mental Subtraction

Using number facts
'Story' of 4, 5, 6, 7, 8 and 9
  e.g. *'Story' of 7 is 7 – I = 6, 7 – 2 = 5, 7 – 3 = 4*
Number bonds to 10
  e.g. *10 – I = 9, 10 – 2 = 8, 10 – 3 = 7*

$$10 – 7 = 3$$

Subtract using patterns of known facts
  e.g. *7 – 3 = 4 so we know 27 – 3 = 24, 47 – 3 = 44, 77 – 3 = 74*

Using number facts
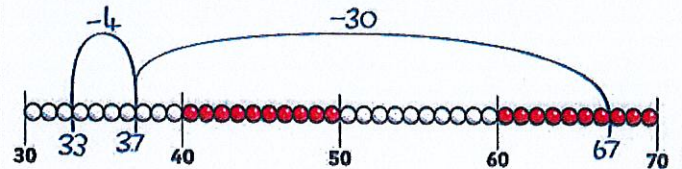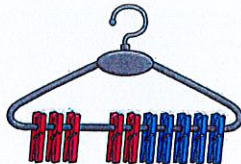Know pairs of numbers which make the numbers up to and including 12 and derive related subtraction facts
  e.g. *10 – 6 = 4, 8 – 3 = 5, 5 – 2 = 3*
Subtract using patterns of known facts
  e.g. *9 – 3 = 6, so we know 39 – 3 = 36, 69 – 3 = 66, 89 – 3 = 86*

$$-3$$
0   10   20   30   36 39 40   50
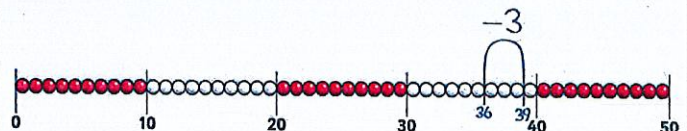
Bridging 10
  e.g. *52 – 6 as 52 – 2 (50) – 4 = 46*

$$-4 \quad -2$$
46   50 52
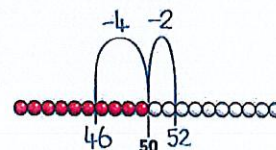
Counting up
Find a difference between two numbers on a line where the numbers are close together
  e.g. *51 – 47*

Multiplication

Year 1

Mental Multiplication

Counting in steps ('clever' counting)

Count in 2s

2 2 2 2 2 2 2 2 2

0   10   20

Count in 10s

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

Mental Multiplication

Counting in steps ('clever' counting)

Count in 2s, 5s and 10s

5   5   5   5   5   5

0   10   20   30
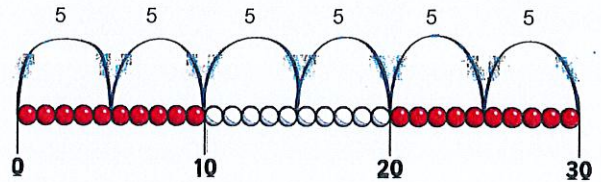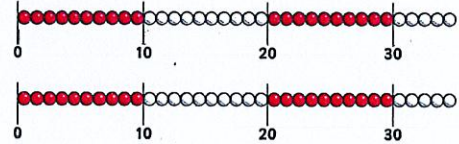
Begin to count in 3s

Doubling and halving

Begin to know doubles of multiples of 5 to 100

  e.g. *double 35 is 70*

0   10   20   30

0   10   20   30

Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5

Year 1

Mental Multiplication

Doubling and halving

Find doubles to double 5 using fingers

  e.g. *double 3*

Year 2
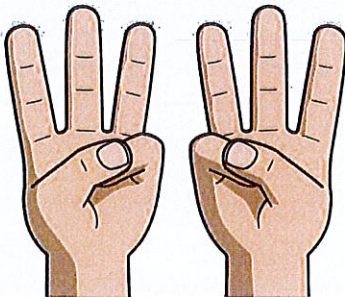
Mental Multiplication

Grouping

Use arrays to find answers to multiplication and relate to 'clever' counting

  e.g. *3 × 4 as three lots of four things*

  e.g. *6 × 5 as six steps in the 5s count as well as six lots of five*

5   5   5   5   5   5

0   10   20   30
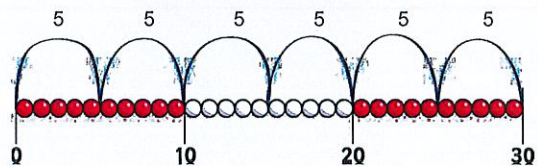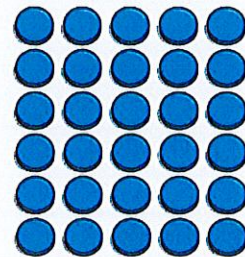
Understand that 5 × 3 can be worked out as three 5s or five 3s

Division

Mental Division

Year 1

Counting in steps ('clever' counting)
Count in 2s

Count in 10s

I	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

Doubling and halving
Find half of even numbers up to 12, including realising that it is hard to halve an odd number
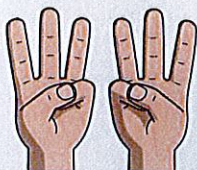
Year 2

Counting in steps ('clever' counting)
Count in 2s, 5s and 10s

Begin to count in 3s

Doubling and halving
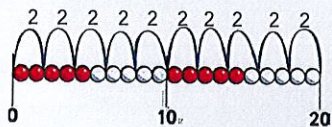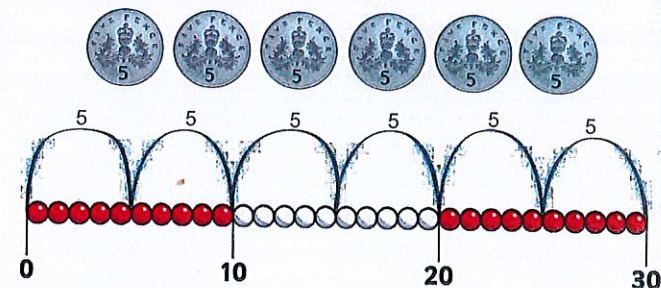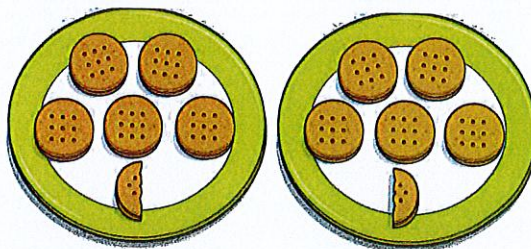Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a 1/2

e.g. $1/2$ of $11 = 5 \ 1/2$

Begin to know half of multiples of 10 to 100
e.g. *half of 70 is 35*

Year 1

Grouping
Begin to use visual and concrete arrays and 'sets of' objects to find the answers to questions such as *'How many towers of three can I make with twelve cubes?'*

Sharing
Begin to find half of a quantity using sharing
e.g. *find half of 16 cubes by giving one each repeatedly to two children*

Year 2

Grouping
Relate division to multiplication by using arrays or towers of cubes to find answers to division
e.g. *'How many towers of five cubes can I make from twenty cubes?'* as $\_ \times 5 = 20$ and also as $20 \div 5 = \_$

Relate division to 'clever' counting and hence to multiplication
e.g. *'How many fives do I count to get to twenty?'*

Sharing
Begin to find half or a quarter of a quantity using sharing
e.g. *find a quarter of 16 cubes by sorting the cubes into four piles*
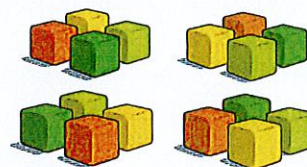
Find 1/4, 1/2, 3/4 of small quantities

$\frac{1}{2}$		$\frac{1}{2}$	
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$

Using number facts
Know half of even numbers to 24
Know ×2, ×5 and ×10 division facts
Begin to know ×3 division facts

COUNTING IDEAS

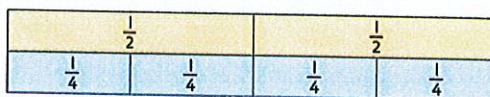❖ Practise chanting the number names. Encourage your child to join in with you. When they are confident, try starting from different numbers - 4, 5, 6 . . .

❖ Sing number rhymes together - there are lots of commercial tapes and CD's available.

❖ Give your child the opportunity to count a range of interesting objects (coins, pasta shapes, buttons etc.). Encourage them to touch and move each object as they count.

❖ Count things you cannot touch or see (more difficult!!). Try lights on the ceiling, window panes, jumps, claps or oranges in a bag.

❖ Play games that involve counting (e.g. snakes and ladders, dice games, games that involve collecting objects).

❖ Look for numerals in the environment. You can spot numerals at home, in the street or when out shopping.

❖ Cut out numerals from newspapers, magazines or birthday cards. Then help your child to put the numbers in orders.

❖ Make mistakes when chanting, counting or ordering numbers. Can your child spot what you have done wrong?

❖ Choose a number of the week e.g. 5. Practise counting to 5 and on from 5. Count out groups of 5 objects (5 dolls, 5 bricks, 5 pens). See how many places you can spot the numeral 5.

PRACTISING NUMBER FACTS
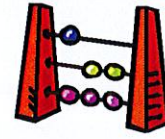
¤ Find out which number facts your child is learning at school (addition facts to 10, times tables, doubles etc). Try to practise for a few minutes each day using a range of vocabulary.

¤ Have a 'fact of the day'. Pin this fact up around the house. Practise reading it in a quiet, loud, squeaky …. voice. Ask your child over the day if they can recall the fact.

¤ Play 'ping pong' to practise complements with your child. You say a number. They reply with how much more is needed to make 10. You can also play this game with numbers totalling 20, 100 or 1000. Encourage your child to answer quickly, without counting or using fingers.

¤ Throw 2 dice. Ask your child to find the total of the numbers (+), the difference between them (-) or the product (x). Can they do this without counting?

¤ Use a set of playing cards (no pictures). Turn over two cards and ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in 2 minutes?

¤ Play Bingo. Each player chooses five answers (e.g. numbers to 10 to practise simple addition, multiples of 5 to practise the five times tables). Ask a question and if a player has the answer, they can cross it off. The winner is the first player to cross off all their answers.

¤ Give your child an answer. Ask them to write as many addition sentences as they can with this answer (e.g. 10 = □+□). Try with multiplication or subtraction.

¤ Give your child a number fact (e.g. 5+3=8). Ask them what else they can find out from this fact (e.g. 3+5=8, 8-5=3, 8-3=5, 50+30=80, 500+300=800, 5+4=9, 15+3=18). Add to the list over the next few days. Try starting with a x fact as well.

Maths Websites

www.primaryinteractive.co.uk

www.primarygames.com

www.nrich.maths

www.nnparentstoolkit.org.uk

www.mathsplayground.com

www.multilpication.com/interactive_games.htm

www.times-tables.com

Abacus

The school has purchased the Abacus scheme to support the New Curriculum.
Your child has received a password and a username to enable them to log on to the online platform. Once on the platform your child can access a range of games to help support mathematical understanding.