

Guidance for Parents
Helping your child with maths

The aim of this booklet is to inform parents how they can support their child with their maths learning and to give guidance on how to assist their child with their maths homework.

Many of the methods that children are taught today are quite different from the methods that we may have learnt at school. This is because today there is a greater emphasis on using key facts, as well as encouraging children to work mentally, as they progress through a problem.

Here is a list of key facts that children should acquire in order to use informal and formal methods for the four rules of number:-

- A good understanding of place value.
567 The digit 6 is worth 6 tens or 60
 The digit 5 is worth 5 hundreds or 500
- Able to partition numbers
567 = 500 + 60 + 7
- Know all addition and subtraction facts to 20
3 + 16 = 19 17 - 4 = 13
- Know all addition and subtraction facts for the pairs of multiples of 10 that make 100
50 + 50 = 100 100 - 30 = 70
- Know all multiplication and division facts up to 12 x 12
- Be able to halve and double numbers mentally
- Recognise and be able to use patterns when multiplying and dividing by 10, 100 and 1000.

Multiply by 10

| | | | |
|---|---|---|---------------------|
| H | T | U | |
| | 5 | | digits move 1 place |
| 5 | 0 | | to the left |

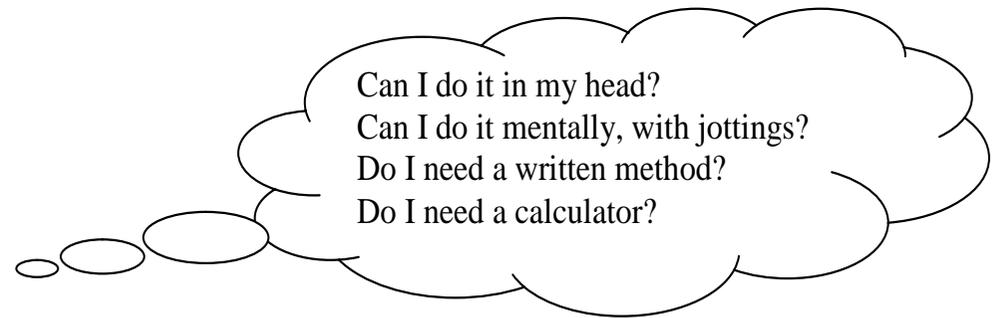
Dividing by 100

| | | | |
|---|---|---|----------------------|
| H | T | U | |
| 5 | 0 | 0 | digits move 2 places |
| | | 5 | to the right |

We believe that it is important that children are secure in their ability to make effective mathematical decisions. In order to do this successfully they must be able to decide:-

- How the calculation should be tackled
- Which strategy would be the most appropriate for the numbers involved

When a child is presented with a calculation problem, encourage your child to think through the following strategies:



It is also helpful to encourage your child to estimate and then check whether their answer is sensible?

The following pages show the agreed methods that are taught at school. They are written in a sequential order. If your child is failing to understand a method it may mean that they are not secure in their understanding of an earlier step.

As children will acquire knowledge and understanding of maths at different rates, there is not a set time when your child should move onto the next step.

Addition

Children are taught to understand that addition is calculated by either combining two sets as well as counting on.

$$2 + 3 =$$

Jane has 3 sweets. She is given 2 more. How many sweets does Jane have now?



Children can begin to solve addition calculations by drawing pictures to help them to work out the answer.

$$2 + 6 =$$

2 children were in the playground. 6 more children come out to play. How many children are now in the playground?

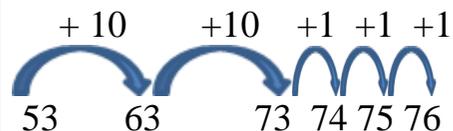
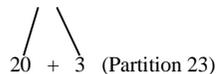


Once children understand that addition is calculated by combining two groups, they should move onto using dots or marks to represent objects.

$$23 + 53 =$$

Sally has 23 marbles. Tom has 53 marbles. How many marbles are there altogether?

$$53 + 23 =$$



Children will begin to partition the numbers into tens and units. Count on the tens, then the units.

It is important to encourage your child to count on from the larger number first.

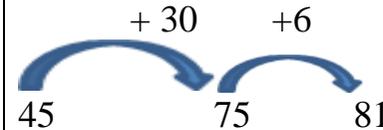
Children will use a number line to help them organise their workings.

Addition

$$36 + 45 =$$

There are 36 boys and 45 girls at a play centre. How many children are there altogether?

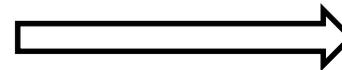
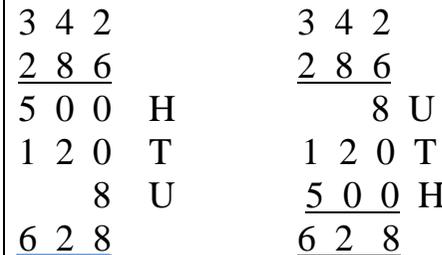
$$45 + 36 =$$



Still using number lines, children should continue partitioning numbers but adding groups of tens and units.

They will still use this method in Year 3 to solve addition calculations using multiple groups of hundreds, tens and units.

$$342 + 286 =$$



Moving from adding the most significant digit to the least significant digit first

In Year 3 children will begin to use an expanded method for addition. They will partition each digit and then add them together using this vertical method, before combining them to calculate the final total. This method is important as it helps them to organise their understanding of partitioning mentally.

They may begin adding from the most significant digit first.

$$\begin{array}{r} 34571 \\ + 25677 \\ \hline 60248 \\ 111 \end{array}$$

Children should 'carry' to the next column under the calculation.

When children are confident in addition they will be taught the compact method.

Please note - Children may initially be taught to add decimals using the expanded method before using the compact method.

Subtraction

Children are taught to understand that subtraction is taking away (counting backwards) as well as finding the difference (counting up to the larger number).

$$6 - 2 =$$

(Taking away)

Anika has 6 sweets, she eats 2. How many sweets are left?



(Finding the difference)

A lollipop costs 6p and a sweet costs 2p. How much more does a lollipop cost than a sweet?



As with addition, children will initially use pictures to help them to visualise a problem.

$$8 - 3 =$$

(Taking away)



(Finding the difference)

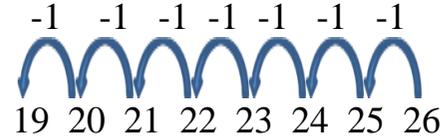


Children will then move on to using dots or marks for subtraction, as this will help them to solve the calculation more quickly.

Subtraction

(Taking away)

Amir has 26 marbles. He gives 7 to his brother. How many marbles does he have left?



Children will begin to take away numbers on a number line.

It is important for children to write the larger number at the end of the number line before they begin to solve the calculation.

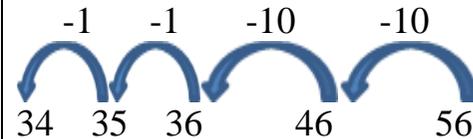
Children will count back initially in groups of ones (units).

(Taking away)

$$56 - 22 =$$

First stage – Single jumps

There were 56 people on a bus. 22 people got off the bus. How many passengers are still on the bus?



When children begin to take away using two digit numbers, they will need to partition the numbers into tens and units. They will count back in groups of tens first, as this links with their mental strategies.

Second stage – Multiple jumps

There were 56 people on a bus. 22 people got off the bus. How many passengers are still on the bus?



When children are secure with their understanding of place value they will be taught to subtract in groups of multiples of tens and units.

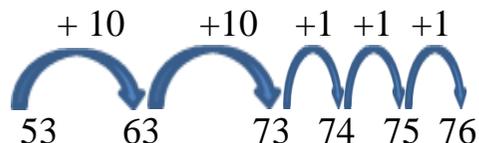
Subtraction

(Finding the difference)

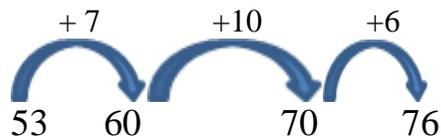
There were 76 people on a bus. 53 people got off the bus. How many passengers are still on the bus?

Stage 1- Single Value Jumps

$$76 - 53 =$$



Second stage – Multiple jumps



$$76 - 21 =$$

$$\begin{array}{r} 70 \ 6 \\ - \ 20 \ 1 \\ \hline 50 \ 5 \end{array}$$

$$345 - 123 =$$

$$\begin{array}{r} 300 \ 40 \ 5 \\ - \ 100 \ 20 \ 3 \\ \hline 200 \ 20 \ 2 \end{array}$$

In this method for subtraction children will need to find the difference between the two numbers. They will count the numbers in between using complementary addition. They will still use a number line to structure their workings.

When children are secure with their understanding of place value they will be able to solve the calculation by counting to and from the helpful multiples of 10 or 100.

In Year4 children will begin to record their method for subtraction vertically. They will be taught to use an expanded method first where they will need to partition the number using their knowledge of place value.

Subtraction

Subtraction with decomposition

(tens to units)

$$\begin{array}{r} 200 \ 40 \ 1 \\ - \ 100 \ 10 \ 3 \\ \hline 100 \ 30 \ 8 \end{array}$$

Subtraction with decomposition

(Hundreds to tens)

$$\begin{array}{r} 400 \ 20 \ 4 \\ - \ 100 \ 80 \ 2 \\ \hline 300 \ 40 \ 2 \end{array}$$

Subtraction with decomposition

(mixed place values)

$$\begin{array}{r} 500 \ 10 \ 5 \\ - \ 200 \ 40 \ 8 \\ \hline 300 \ 70 \ 7 \end{array}$$

$$\begin{array}{r} 3 \ 14 \ 16 \\ 4 \ 5 \ 6 \\ \hline \cancel{3} \ \cancel{8} \ \cancel{8} \\ 0 \ 6 \ 8 \end{array}$$

N.B

All subtraction notations should be written above the calculations.

When children are confident in their ability to organise their workings using the expanded method for subtraction, they will be taught how to decompose tens to units and then hundreds to tens.

In our school we use the term ‘decomposition’ and not ‘exchanging’ or ‘borrowing’.

Finally children will be taught the formal compact method for subtraction.

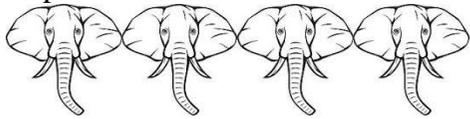
Please note - Children may initially be taught to subtract decimals using the expanded method before using the compact method.

Multiplication

Children are taught to understand that multiplication as repeated addition. It can also be shown as an array (groups of dots). It is really important that you help your child to practise and learn their times table facts. In Year 1, children will begin to learn their x2 table. It is a national expectation that all children by the end of year 4 should know all their table facts to 12 x 12.

$2 \times 4 =$

An elephant has two ears. How many ears are there on four elephants?



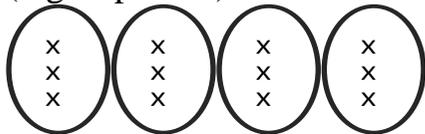
$4 \times 5 =$

How many fingers are there on four hands?



$4 \times 3 =$

(4 groups of 3)



$4 \times 5 =$

A sweets costs 5p. How much will it cost to buy 4 sweets.

XXXX XXXXX
 XXXX XXXXX
 XXXX or XXXXX
 XXXX XXXXX
 XXXX

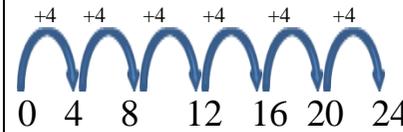
Children will begin to solve multiplication problems practically and draw pictures to show their workings.

They will then group dots, crosses or other marks to find groups of.

Drawing an array of dots or crosses gives the children a clear image of the calculation. It also helps children to identify associated multiplication facts.

Multiplication

$4 \times 6 =$



From Year 2 children will use an empty number line to count on equal steps. This will reinforce that multiplication is repeated addition.

$14 \times 5 = 70$ (teen numbers)

$10 \times 5 = 50$

$4 \times 5 = 20$

When children begin to multiply a two digit number by a single digit they will use an informal partitioning method. They will begin by using teens numbers.

$34 \times 5 = 170$

$30 \times 5 = 150$

$4 \times 5 = 20$

When multiplying by multiples of ten children need to be secure in their understanding of impact of how the values of each digit change when multiplying by ten.

It is really important that children take care to ensure that they line the digits carefully in the appropriate place value column.

$34 \times 3 = 102$

| | | | |
|---|----|----|------|
| | 30 | 4 | |
| 3 | 90 | 12 | =102 |

The children will then use the 'grid method' to partition and multiply each digit, before combining the total.

$34 \times 22 = 748$

| | | | |
|----|-----|----|------|
| | 30 | 4 | |
| 20 | 600 | 80 | =680 |
| 2 | 60 | 8 | =68 |
| | | | 748 |

The children will then use this method to multiply tens and units by tens and units (long multiplication).

Multiplication

Standard Short Multiplication Method

$$\begin{array}{r} 23 \\ \times 6 \\ \hline 138 \\ 1 \end{array}$$

$$\begin{array}{r} 123 \\ \times 4 \\ \hline 492 \\ 1 \end{array}$$

Children should 'carry' to the next column under the calculation.

In the upper years of Key Stage Two, children will begin to structure multiplication using the formal method.

They will begin with short multiplication, writing and solving the calculation vertically.

Extended Long Multiplication Method

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 42 \quad (6 \times 7) \\ 350 \quad (7 \times 50) \\ 120 \quad (20 \times 6) \\ 1000 \quad (20 \times 50) \\ \hline 1512 \\ 1 \end{array}$$

The first step that children will use to solve a long multiplication calculation is to write each step in brackets. This will help them to ensure that they are recording all the necessary steps accurately.

Compact Long Multiplication Method

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 392 \quad (56 \times 7) \\ 1120 \quad (56 \times 20) \\ \hline 1512 \\ 1 \end{array}$$

Some children may progress to recording their multiplication in a more compacted form.

Division

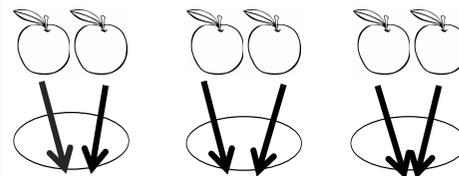
Children are taught to understand division as sharing and grouping. In Key Stage Two children are expected to know and use the associated times table facts to recall division facts.

$$8 \div 2 =$$

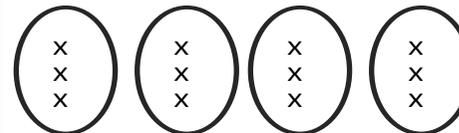
How many pairs of socks can you make with 8 socks?



Share 6 apples between 3 people.



$$12 \div 4 =$$

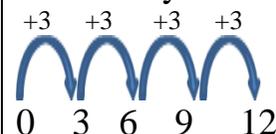


$$16 \div 4 =$$

XXXX
XXXX
XXXX
XXXX

$$12 \div 3 =$$

A sweet cost 3p. I have 12p.
How many sweets can I buy?



Children will begin to solve division problems practically and draw pictures to show their workings.

They will then group dots, crosses or other marks to find groups of.

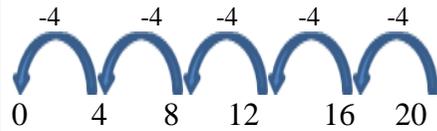
Drawing an array of dots or crosses gives the children a clear image of the calculation.

As with multiplication, children will begin to record their division calculations on a number line.

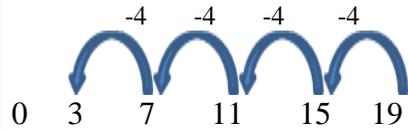
This will reinforce knowledge of multiplication tables.

Division

$$20 \div 4 = 5$$



$$19 \div 4 = 4 \text{ r } 3$$



Children should also be able to solve division calculations by counting backwards. This will reinforce the concept that division is repeated subtraction.

Children will also use this method to find remainders

$$64 \div 4$$

Key facts

| | | | |
|----|----|-----|----------|
| 1 | 4 | | |
| 2 | 8 | 4 | 64 |
| 4 | 16 | -40 | (10 x 4) |
| 5 | 20 | 24 | |
| 10 | 40 | -20 | (5x4) |
| | | 4 | |
| | | -4 | (1x4) |
| | | 0 | |

In Year 4 children will begin to use written methods for division. They will use a non-standard method, called 'chunking', first.

It is really important to list the key multiplication facts by the calculation. At this stage children should be encouraged to estimate the answer first.

$$464 \div 4 = 116$$

Key facts

| | | | |
|----|----|------|-----------|
| 1 | 4 | | |
| 2 | 8 | 4 | 464 |
| 4 | 16 | -400 | (100 x 4) |
| 5 | 20 | 64 | |
| 10 | 40 | -40 | (10x4) |
| | | 24 | |
| | | -24 | (6x4) |
| | | 0 | |

The previous method can also be shortened by subtracting larger groups ('chunks') as the children become more secure in their mental strategies.

Division

Standard written Method for Short Division

$$\begin{array}{r} 36 \\ 4 \overline{) 1424} \end{array}$$

With remainders

$$\begin{array}{r} 136 \text{ r}2 \\ 4 \overline{) 51426} \end{array}$$

Some children in Years 5 and 6 will be able to use the standard written method for long and short division.

Standard Written Method for Long Division

$$\begin{array}{r} 28 \text{ R}12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

(20x15)

(8 x 15)

At this stage children would be expected to know when to display the remainder as a decimal or a fraction.

How can I help my child at home?

There are many different ways in which you can help your child at home with maths besides supporting them with their homework. Maths should be enjoyable, so if you are supporting your child at home make it fun and practical. On the next two pages we have included some activities you could do with your child.

- Practise frequently the appropriate number facts (addition and subtraction facts to 20, pairs of tens that make one hundred as well as table facts), this could easily be done on a car journey to the shops!
- Play bingo. This can help younger children to identify tens and units in a number. Older children could use multiplication table facts or even find the difference between two numbers.
- Target number – how many different ways can you make a given target number. When shopping with your child, encourage them to find the prices of items. What coins could they use to buy an item? How much will it cost to buy two or three items? Encourage them to think about the change that they may get.
- Also on shopping trips older children could also look at price reductions or extras. Excellent way to introduce percentages.
- Bus or train journeys – look at the timetables. What time would the next train or bus arrive? How long will it take to get to the next stop or destination?

- Bake a cake. Help your child to measure out the ingredients and discuss with your child the different intervals on a measuring jug or kitchen scales. If the recipe makes 12 cakes – how much of each ingredient would you need to make 6 or 24 cakes?
- Food item packages – how much does a bag of flour weigh? Can your child convert grams to kilograms?
- Shape detectives – search for different 2D and 3D shapes around the house.
Make a junk-model or a sticky picture using 2D shapes – Can your child name the shapes and describe the properties of the packing? i.e. a cereal box is a cuboid. It has 6 faces make from rectangles.
- Plan and organise a day trip during the school holidays, or a weekend. Ask your child to think about:-
 - a) How much the day could cost?
 - b) What time would you need to leave?
 - c) How long was the journey?
 - d) How far did you travel?
- When watching T.V. discuss with your child the programme display. How long does a programme last for? If the programme started five minutes later, what would be the new starting time of the programme?
- Support telling the time – do use both analogue and digital clocks and watches.
- Compare lengths of objects – can your child find an object that is bigger or smaller than 1m or wider or narrower than a bus?