

Helping your child with maths calculations:

A guide for parents



CALCULATION

The maths your child is doing at school may look very different to the kind of 'sums' you remember. This is because children are encouraged to work mentally where possible, using personal jottings to help support their thinking. Even when children are taught more formal written methods, they are only encouraged to use these methods for calculations they cannot solve in their heads. This booklet explains the progression that children go through in the development of written calculations and some of the mental strategies they will be using in school. We have also included some ideas for practising skills in different areas of maths and have listed some useful websites which you might like to look at. We hope you find this booklet helpful!

Discussing thinking, reasoning and the suitability of different strategies is very important.

Talk to your child about how they have worked things out.

Ask them to explain their thinking and reasoning.



When faced with a calculation problem, encourage your child to ask...

Can I do this in my head?

Could I do this in my head using drawings or jottings to help me keep track of my calculations?

Do I need to use a written method?



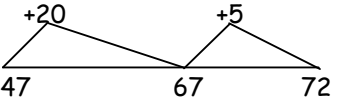
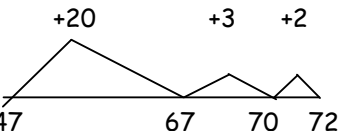
Should I use a calculator?



Also help your child to estimate the answer before they begin and to check their final answer. Encourage them to ask, 'Does the answer seem sensible?'

ADDITION

Children are taught to understand addition as combining two sets and as counting on.


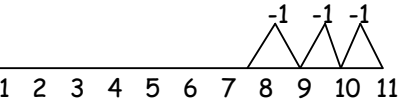
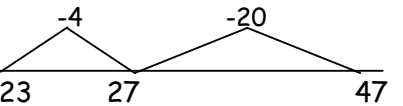
<p>2+3= At a party, I eat 2 sweets and my friend eats 3. How many sweets did we eat altogether?</p> 	<p>Children could use real objects or draw a picture to help them work out the answer.</p>
<p>7+4= 7 people are on a bus. 4 more get on at the next stop. How many people are on the bus now?</p> 	<p>Children could use dots or tally marks to represent objects (this is quicker than drawing pictures)</p>
<p>47+25= My sunflower is 47cm tall. It grows another 25cm. How tall is it now?</p>  <p>or</p> 	<p>Drawing an empty number line helps children to record the steps they have taken in a calculation (start on 47, +20, then +5). This is much more efficient than counting on in ones.</p>

ADDITION

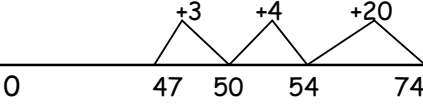
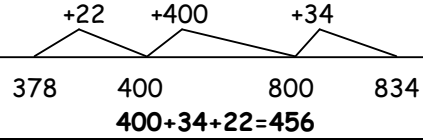
<p>47+76= I have 47 stickers. My friend has 76. How many do we have altogether?</p> <p>47+76= 47+70+6= 117+6=123 OR 47+76= (40+70)+(7+6)= 110+13= 123</p>	<p>Children partition or 'split up' the numbers to be added into tens and ones. They add these up separately then find the total. This leads to the 'column' method we learned at school!</p>
<p>487+546= There are 487 boys and 546 girls in a school. How many children are there altogether?</p> $\begin{array}{r} 546 \\ +487 \\ \hline 900 \end{array} \begin{array}{l} (500 + 400) \\ 13 (6 + 7) \end{array}$ $\begin{array}{r} 546 \\ +487 \\ \hline 120 \\ \hline 1033 \end{array} \begin{array}{l} (40 + 80) \\ (500 + 400) \end{array}$	<p>Children will be taught written methods for those calculations they can't do 'in their heads'. Expanded methods build on mental methods and make the value of the digits clear to children. Adding the most significant first and then the least significant digits first in preparation for 'carrying'</p>
<p>625+48= There are 625 children in the school and 48 members of staff. How many people altogether?</p> $\begin{array}{r} 625 \\ +48 \\ \hline 673 \\ 1 \end{array}$	<p>When using this method it is really important that the correct place value of the digits is understood. e.g 5 and 8 makes 13 which is 1 ten and 3 units, the ten is carried into the tens column, the three is recorded in the units column. Twenty and forty is sixty add on the carried ten makes seventy which we record as a 7 in the tens column, 7 tens is seventy etc</p>

SUBTRACTION

Children are taught to understand subtraction as taking away (counting back) and finding the difference (counting on).

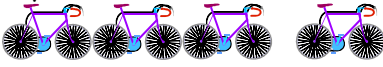
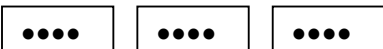
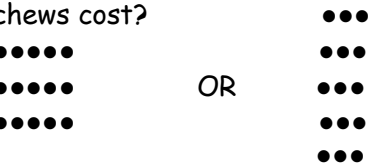
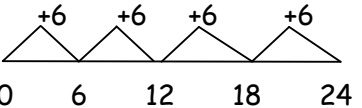
<p>5-2= I had five balloons. Two burst. How many did I have left?  take away</p> <p>A teddy bear costs £5 and a doll costs £2. How much more does the bear cost? <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> find the difference <input type="radio"/> <input type="radio"/> difference</p>	<p>Children could use real objects to work out the answer. Drawing a picture helps children to visualise the problem.</p>
<p>11-3= 11 girls are in the dance class but 3 go home. How many are left?</p> 	<p>The numberline is used to show that 11 - 3 means the 'difference between 11 and 3' or 'the difference between 3 and 11' and how many jumps they are apart. This then leads to counting back in tens and then units.</p>
<p>47-23= 47 children in the class, 23 are boys. How many girls are there?</p> 	<p>Then helping children to become more efficient by subtracting the tens in one jump and the units in another jump.</p>

SUBTRACTION

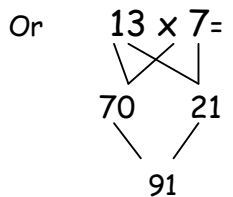
<p>74-27= I cut 27cm off a ribbon measuring 74cm. How much is left?</p> 	<p>It can be more efficient and easier for pupils to count on when bridging through the ten. Count up from 47 to 74 in units and jumps of ten. The number line should still show 0 so children can cross out the section from 0 to the smallest number. They then associate this method with 'taking away'.</p>
<p>834-378= The library owns 834 books. 378 are out on loan. How many are on the shelves?</p>  <p style="text-align: center;">400+34+22=456</p>	<p>Children could count up (from the smallest number to the biggest) using an empty number line. It's easiest to count up to a multiple of 10 or 100 (a friendly number). The steps are then added together to find the solution to the calculation.</p>
<p>78-27= 78 people went to a party. 27 went home at ten o'clock. How many people were left? 78-27= 78-20-7= 58-7= 51</p>	<p>Children can partition or 'split' the number to be subtracted into tens and ones. They can then take these away separately.</p>

MULTIPLICATION

By Year 4 all pupils should be frequently learning their times tables to 10 x 10

<p>4x2 = How many wheels are there on 4 bicycles?</p>  <p style="text-align: center;">$2 + 2 + 2 + 2 = 8$</p>	<p>Children are taught to understand multiplication as repeated addition. It can also be used to describe an array.</p> <p>It is really a important stage that children experience multiplication in context, ie. pairs of socks, egg boxes, fingers and toes etc</p>
<p>3x4 = There are 4 cakes in a pack. How many cakes in 3 packs?</p>  <p style="text-align: center;">$4 + 4 + 4 = 12$</p>	<p>Dots or tally marks can be drawn in groups to represent the problem. This shows 3 groups of 4.</p>
<p>5x3= A chew costs 5p. How much do 3 chews cost?</p> 	<p>Drawing an array (3 rows of 5 or 3 columns of 5) gives children an image of the answer. It also helps develop the understanding that 5x3 is the same as 3x5.</p>
<p>6x4= There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?</p> 	<p>Children could count on in equal steps (repeated addition), recording each jump on an empty number line. This shows 4 jumps of 6 but children could also do 6 jumps of 4 if they find this easier, as multiplication can be done in any order.</p>

MULTIPLICATION

<p>13x7 There are 13 biscuits in a packet. How many biscuits in 7 packets?</p> <p style="text-align: center;">$13 \times 7 =$ $= (10 \times 7) + (3 \times 7) = 70 + 21 = 91$</p> <p>Or</p> 	<p>When numbers get bigger, it is inefficient to do lots of small jumps on a numberline. Partitioning is now used to multiply the tens and the units by the multiplier. Children could record these in number sentences.</p>								
<p>38x7= How much would it cost to buy 7 coats at £38 each?</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">x</td> <td style="border-bottom: 1px solid black; padding: 5px;">30</td> <td style="border-bottom: 1px solid black; padding: 5px;">8</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">7</td> <td style="padding: 5px;">210</td> <td style="padding: 5px;">56</td> </tr> </table> <p style="text-align: center;">$= 210 + 56 = 266$</p>	x	30	8	7	210	56	<p>This is called the grid method. 38 is partitioned into tens and units and each of these is multiplied by 7. The two answers are then added together.</p>		
x	30	8							
7	210	56							
<p>6x124= 124 books were sold. Each book cost £6. How much money was taken?</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">x</td> <td style="border-bottom: 1px solid black; padding: 5px;">100</td> <td style="border-bottom: 1px solid black; padding: 5px;">20</td> <td style="border-bottom: 1px solid black; padding: 5px;">4</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">6</td> <td style="padding: 5px;">600</td> <td style="padding: 5px;">120</td> <td style="padding: 5px;">24</td> </tr> </table> <p style="text-align: center;">$= 600 + 120 + 36 = 744$</p>	x	100	20	4	6	600	120	24	<p>We then extend to hundreds, tens and units in the same grid method</p>
x	100	20	4						
6	600	120	24						

MULTIPLICATION

Extending to two-digit by two-digit multiplications.

56x27=

56x27 is approx. 60x30= 1800

x	20	7	
50	1000	350	1350
6	120	42	<u>162</u>
			= <u>1512</u>

Always ask children to estimate first. Again, children will use the grid method. When secure with this method they then extend to ThHTU x U
Encourage the children to add up mentally first but then they may need a suitable written method if they cannot add mentally.

4.9 x 3 =

4.9 x 3 is approx 5 x 3 =15

x	4	0.9
3	12	2.7

= 12 + 2.7 = 14.7

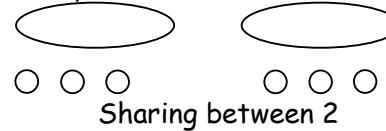
Using similar methods, they will be able to multiply decimals with one decimal place by a single digit number, approximating first. They should know that the decimal points line up under each other.

DIVISION

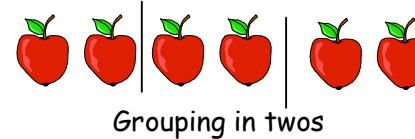
Children are taught to understand division as sharing and grouping.

6 ÷ 2 =

6 biscuits are shared between 2 plates. How many are put on each plate?



There are 6 apples. How many children can have two each?

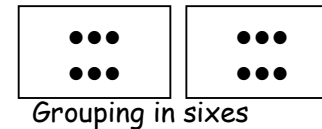


Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.

Drawing often gives children a way into solving the problem.

12 ÷ 6 =

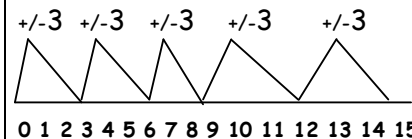
Eggs come in boxes of 6. How many boxes can you fill with 12 eggs?



Dots or tally marks can either be shared out one at a time or split up into groups.

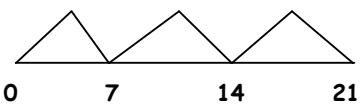
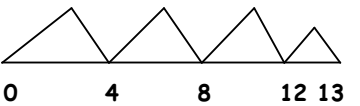
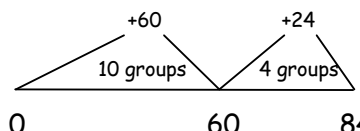
15 ÷ 3

15 biscuits are shared between 3 friends. How many do they get each?

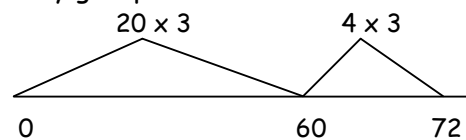


Repeated addition and subtraction using a number line

DIVISION

<p>21 ÷ 7 = A chew bar costs 7p. How many can I buy with 21p?</p> 	<p>To work out how many 7s in 21, draw jumps of 7 along a number line. This shows that 3 lots of 7 make 21. The emphasis is now on grouping rather than sharing.</p>
<p>13 ÷ 4 = 13 children are going on a car journey. 4 children can get into each car. How many cars are required?</p>  <p>3 full cars and 1 extra for the last child, so 4 cars in total.</p>	<p>Children should also move onto calculations involving remainders. The question needs to be read clearly to understand how the remainders fit into the answer to the question.</p>
<p>84 ÷ 6 = I need 6 drawing pins to put up a picture. How many pictures can I put up with 84 pins?</p> 	<p>It would take a long time to jump in sixes to 84 so children add and subtract multiples of the divisor. A jump of 10 groups of 6 takes you to 60. Then you need another 4 groups of 6 to reach 84. Altogether, that is 14 sixes.</p>

DIVISION

<p>72 ÷ 3 = 72 pupils need to organise themselves into groups of 3. How many groups will there be?</p>  <p>Or</p> $ \begin{array}{r} 72 \\ - 60 \quad (20 \times 3) \\ \hline 12 \\ - 12 \quad (4 \times 3) \\ \hline 0 \\ = 20 + 4 = 24 \text{ groups} \end{array} $	<p>We can then extend from the numberline to a vertical method of division. This is known as the 'Chunking method' This method is based on subtracting chunks of the number you are dividing by. It's more efficient to subtract the largest chunks possible. Start by subtracting the largest possible multiple of 10. In this example, as you are dividing by 3, first subtract 60 (20 groups of 3), leaving 12. Then subtract 12 (4 groups of 3), to leave 0. Altogether, that is 24 groups of three with no remainder.</p>
<p>87 ÷ 7 = 7 pencils fit in a packet. If you have 87 pencils, how many packets can be filled?</p> $ \begin{array}{r} 87 \\ - 70 \quad (10 \times 7) \\ \hline 17 \\ - 14 \quad (2 \times 7) \\ \hline 3 \\ = 10 + 2 = 12 \text{ r } 3 \\ 12 \text{ full packets and 3 spare pencils} \end{array} $	<p>Extending the chunking method to involve remainders. Children need to be able to decide what to do after division and round up or down accordingly depending on the context.</p>

IDEAS TO HELP PRACTISE COUNTING SKILLS & NUMBER RECOGNITION

- 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 . . .
- Make mistakes when chanting, counting or ordering numbers. Can your child spot what you have done wrong?
- 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 or claps.
- Play games that involve counting (e.g. snakes and ladders, dice games, games that involve collecting objects).
- Look for numbers in the environment. You can spot numbers at home, in the street or when out shopping.
- Find numbers on a computer keyboard and practise keying in telephone numbers.
- Cut out numbers from newspapers, magazines or birthday cards. Then help your child to put the numbers in order.
- 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 number 5.



PRACTISING NUMBER FACTS (times tables)

- 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.
- Play games such as darts and skittles which involve adding and subtracting. When playing board games, ask children to predict which number they will land on *before* they move their counter.
- 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?
- Give your child an answer. Ask them to write as many addition sentences as they can with this answer (e.g. $10 = \square + \square$). 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. $3+5=8$, $8-5=3$, $8-3=5$, $50+30=80$, $500+300=800$, $15+3=18$).



USEFUL WEBSITES

[www.woodlands-](http://www.woodlands-junior.kent.sch.uk/maths)

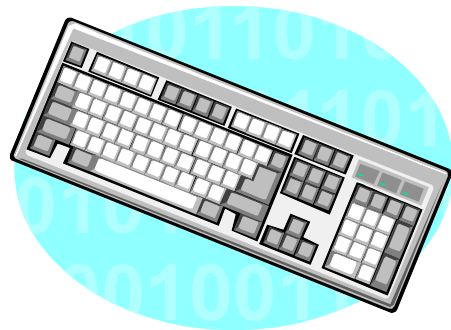
[junior.kent.sch.uk/maths](http://www.woodlands-junior.kent.sch.uk/maths) Practise number bonds to a range of different totals, addition and subtraction, plus a range of learning games.

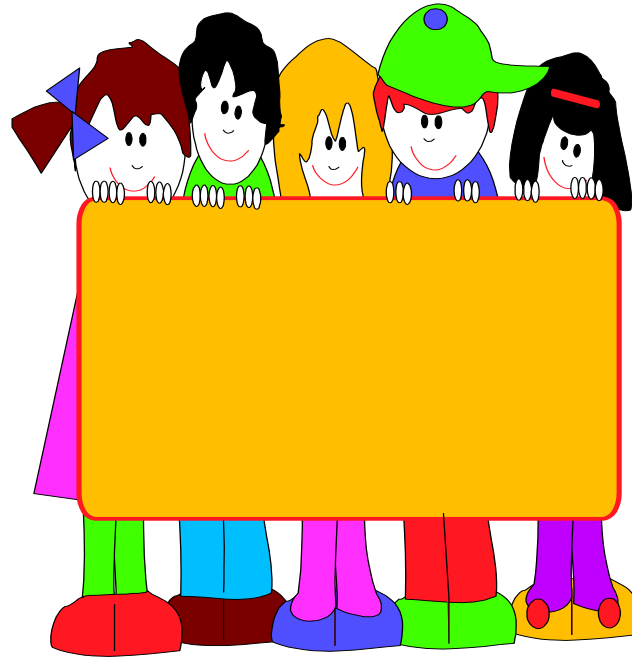
www.ictgames.com/resources Another excellent site with a range of games to practise skills in a range of areas of mathematics.

www.bbc.co.uk/schools Select 'Primary' at the top of the screen, then 'Numeracy.'

www.crickweb.co.uk Select 'KS1' or 'KS2' from the tabs at the top of the screen, then select 'Numeracy' from the dropdown menu.

There are plenty more links to useful sites from the school website.





Make maths fun!

Give your child lots of praise and
encouragement