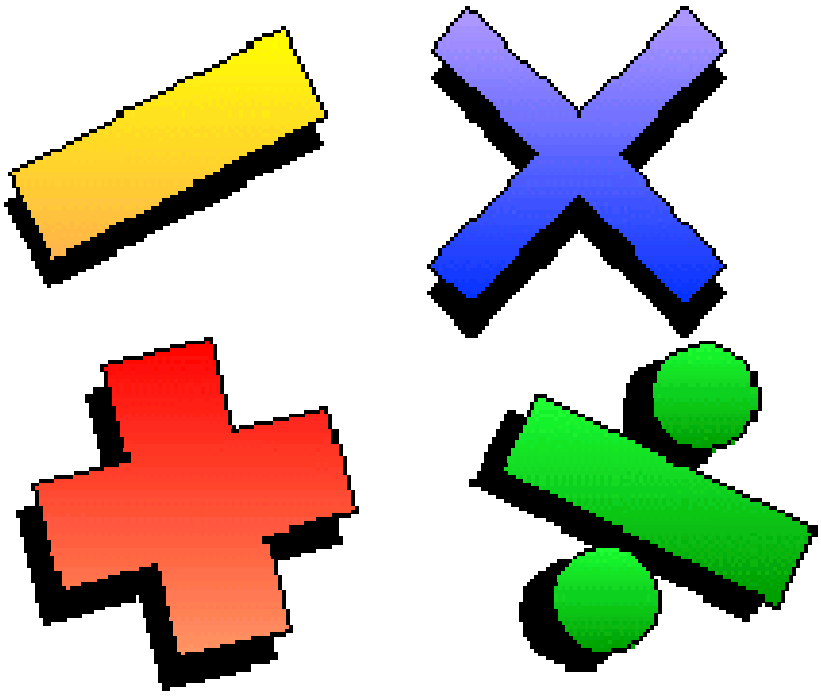
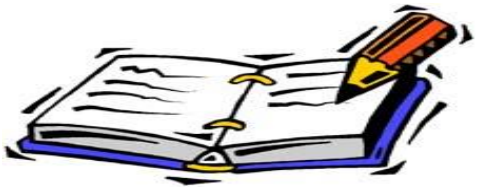


Helping your child with Maths

Calculation

The math's work 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 (from late year 3 onwards), they are only encouraged to use these methods for calculations they cannot solve in their heads.



Discussing the efficiency and suitability of different strategies is an important part of math's lessons.

Talk to your child about how they work things out.

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

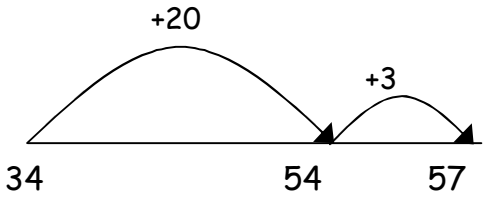
- **Can I do this in my head?**
- **Could I do this in my head using drawings or jottings to help me?**
- **Do I need to use a written method?**

Also, help your child to estimate and then check the answer. Encourage them to ask…

Is the answer sensible?

Addition

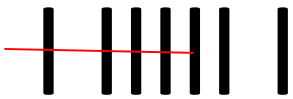
Children are taught to understand addition as combining two sets and counting on.

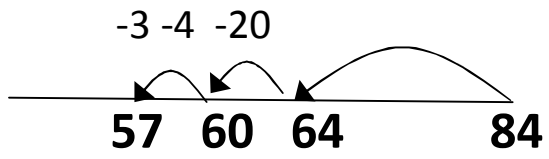
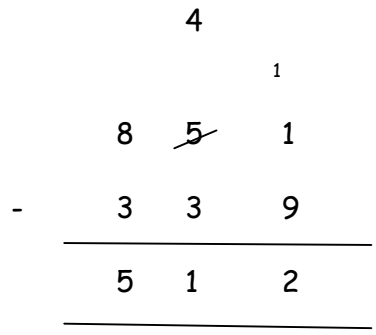
2+3= At a party, I eat 2 cakes and my friend eats 3 cakes. How many cakes do we eat altogether? 	Children are encouraged to represent this information using pictures, diagrams or real objects.
7+4= 7 people are on the bus. At the next stop 4 more get on. How many people are on the bus now? 	Children then begin to represent this information using dots or tally marks (quicker than drawing pictures).
34+23= My sunflower is 34cm tall. It grows another 2cm. How tall is it now? 	Drawing an empty number line helps children to record the steps they have to take in a calculation (start on 34 and add 20 before adding 3). This is much more efficient than counting on in ones.

153+362= There are 153 boys and 362 girls in a school. How many children are there altogether? $\begin{array}{rrrr} & 1 & 5 & 3 \\ + & 3^{1} & 6 & 2 \\ \hline & 5 & 1 & 5 \end{array}$	Children will be taught written methods for calculations they cannot do in their heads. Pupils practise columnar addition with increasingly large numbers, up to 3 digits to become fluent (use of Base 10 materials to model practically before recording). Using similar methods, children will: • add several numbers with different numbers of digits; • know that the decimal points should line up under each other, particularly when adding mixed amounts, e.g. £13.59 + £1.78.
13 754 + 4973= 13 754 people visited the museum last year. The numbers increased by 4 973 this year. How many people visited the museum this year altogether? $\begin{array}{rrrrrr} & 1 & 3 & 7 & 5 & 4 \\ + & & 4^{1} & 9^{1} & 7 & 3 \\ \hline & 1 & 8 & 7 & 2 & 7 \end{array}$	In upper Key Stage 2, pupils will use formal written methods for addition for calculations with any number of digits. This will extend to: • add several numbers with different numbers of digits; • know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 1401.2 + 126.85 + 10.71.

Subtraction

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

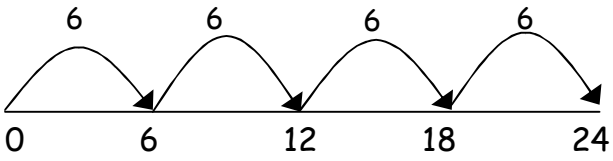
5-2= I have 5 balloons and two burst. How many did I have left? <u>Take away</u>  A teddy bear costs £5 and a doll costs £2. How much more does the bear cost?   <u>Find the difference</u>	Drawing a picture or using real objects helps children to visualize the problem.
7-3= I Mum bakes 7 biscuits. I ate 3. How many were left?  Take away Lisa has 5 pencils and Ton has 3. How many more does Lisa have?  Find the Difference	Children then begin to represent this information using dots or tally marks (quicker than drawing pictures).

84-27= I cut 27cm off a ribbon that measured 84cm. How much is left?  	Children begin to use an empty number line and count backwards. This is a really good way for them to record the steps they have taken (start on 84, -20, -4, then -3). As they become more confident they can make the size of the jumps larger (start at 84, -20, and then -7).
851-339= The library owns 851 books. 339 are out on loan. How many books are on the shelves?  	This is called the formal written method for subtraction. Children draw on their knowledge of number facts and place value. As the children become more comfortable with the method, they use it to subtract whole numbers of four or more digits and decimals with at least two places. They record the calculations clearly, embedding the processes of partitioning and exchange (previously known as borrowing) in the presentation. This method will then to be applied to multi-step (more than two) problems.

Multiplication

Children are taught to understand multiplication as repeated addition and scaling. It can also describe an array.

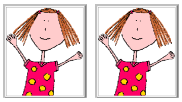
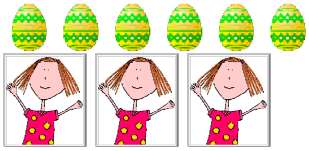
2x4= Each child has two eyes. How many eyes do 4 children have?  2 + 2 + 2 + 2	Again a picture or real objects can be useful.
5x3= There are 5 cakes in a pack. How many cakes in 3 packs? IIIII IIIII IIIII **5 + 5 + 5**	Dots or tally marks are often drawn in groups. This shows 3 groups of 5.
4x6= A chew costs 4p. How much do 6 chews cost?  4 x 6 = 24  6 x 4 = 24	Drawing an array (3 rows of 4 or 3 columns of 4) gives children an image of the answer. It also helps develop the understanding that 4x6 is the same as 6 x4.

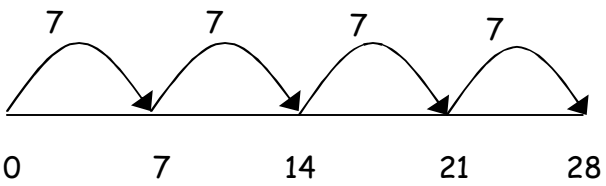
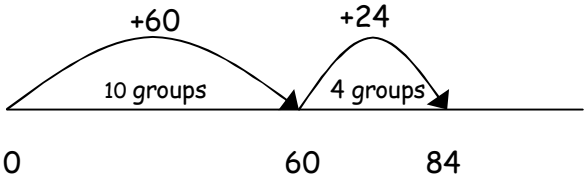
6x4= There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?  	Children can count on in equal steps, recording each jump on an empty number line. This shows
13x7= There are 13 biscuits in a packet. How many biscuits in 7 packets? **13** **10x7+ 3x7** **70 + 21** **91**	When numbers get bigger, it is inefficient to do lots of small jumps. Therefore, numbers are split into parts, in this case the tens (10) and units (3). Then each calculation is worked out before adding the answers together. This is called partitioning.
28x4= 28 books were sold. Each book cost £4. How much money was taken? **×** | **4** **20** | **80** **8** | **32** 112	This is called the grid method. The number 28 is partitioning into individual values for each digit (20 and 8). Each of the values is multiplied by 4 and the answers are then added together. **Always** place the larger number on the left hand side of the grid.

47x8= Each box holds 47 packets of crisps. There are 8 boxes of crisps left on the shelf. How many chocolates are there altogether? **Short multiplication** $\begin{array}{r} \times \quad 4\ 7 \\ \quad\quad 8 \\ \quad {\scriptstyle 5}\ \ \ \\ \hline 3\ 7\ 6 \end{array}$ **54x23=** A bus firm has 23 coaches. Each coach seats 54 people. How many people can travel on the coaches if all the seats are used? **Long multiplication** $\begin{array}{r} \quad 2\ 3 \\ \times \quad 5_1\ 4 \\ \hline {\scriptstyle 1}\ 9\ 2 \\ 1\ 1_1\ 5\ 0 \\ \hline 1\ 2\ 4\ 2 \end{array}$	Following the grid method, children will move on to use the formal written methods for multiplication. Pupils will be reminded to start from the right hand side (the units column).

Division

Children are taught to understand division as sharing and grouping.

6÷2= 6 Easter eggs are shared between 2 children. How many do they get each?  Sharing between 2  There are 6 Easter eggs. How many children can have two each?  Grouping in twos	More Pictures! Drawing often gives children a way into solving the problem.
12÷4= 4 apples are packed into a basket. IIII IIII IIII Grouping in fours	Dots or tally marks can either be shared out one at a time or split up into groups.

28÷7= A chew bar costs 7p. How many can I buy with 28p?  	To work out how many 7's there are in 28, draw jumps along a number line. This shows you need 4 jumps of 7 to reach 28.
84÷6= I need 6 drawing pins to put up a picture. How many pictures can I put up with 84 pins?  	It would take a long time to jump in sixes to 84 so children can jump on in bigger jumps. A jump of 10 groups of 6 takes you to 60. Then a jump of 4 groups of 6 takes you to 84 (as 4 groups of 6 is 24). Altogether that is 14 jumps of 6.
192÷8= 8 pencils fit in each packet. If you have 192 pencils, how many packets will be filled? 192 = **160 + 32** 20 groups + 4 groups = 24 groups	It is important that children understand numbers can be represented in different ways. It is helpful to represent 192 into sensible numbers and as you are dividing by 8 the numbers chosen should be multiples of 8. Then divide each part of the number (how many groups of 8?) before adding the answers together.

184÷7= I need 184 chairs for a concert. I arrange them in rows of 7. How many rows do I need? 19 r2 4 ⟌ 7³6	This method is called 'short division'. This leads to the formal written methods of division. Often pupils will use base ten materials to support their understanding.
432 ÷ 15= I need 432 books for the shelves in the library. If 15 books go on each shelf, how many shelves will I need? 28 r12 15 ⟌ 432 30 132 120 12	As this method is very abstract, it is not introduced until upper key stage 2. • "How many 15s are there in 4?" There are none so now ask "how many 15s are there in 43?" • There are 2. Write 2 on the answer line above the 3 and write 30 (15x2) beneath the 43. • Subtract 30 from 43 and write the answer (13) beneath the 30. • Check that your intermediate answer is smaller than the divisor. If the answer is larger than the divisor (e.g. more than 15) then go back and start again as the first division is incorrect. • Now bring down the next figure (2) and place this digit on the end of the intermediate answer. (e.g. 132) • "How many 15s are there in 132?" There are 8 (15x8 = 120) Write the 8 on the answer line and write 120 (15x8) beneath 132. • Subtract 120 from 132 and write the answer (12) beneath the 120. • As this answer is smaller than the divisor of 15 then this is the remainder. (28 R 12)

Counting Activities

- **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 many commercial CDs 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, windows in a street, jumps, claps or apples in a bag.**
- **Play games that involve counting (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 shopping.**
- **Cut out numerals from a newspaper, magazine or birthday cards. Help your child to put the numbers in order – both increasing and decreasing.**
- **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 in groups of 5 objects (5 dolls, 5 footballs, 5 sweets). See how many places you can spot the numeral 5.**

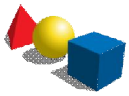
Real Life Problems

- **Go shopping with your child to buy two or three items. Ask them to work out the total amount spent and how much change you will get.**
- **Buy some items with a percentage extra free. Help your child to calculate how much of the product is free.**
- **Plan an outing during the holidays. Ask your child to think about what time you will need to set off and how much money you will need to take.**
- **Use a TV guide. Ask your child to think about the length of their favourite programmes. Can they calculate how long they spend watching TV each day/week?**
- **Use a train or bus timetable. Ask your child to work out how long a journey between two places should take. Go on the journey. Do you arrive earlier or later than expected? How much earlier/later?**
- **Help your child to scale a recipe up or down to feed the right amount of people.**
- **Work together to plan a party or meal within a set budget.**

These are just a few ideas to give you a starting point. Try to involve your child in as many problem-solving activities as possible. The more 'real' a problem is, the more motivated they will be when trying to solve it.

Practising number facts

- **Find out which number facts your child is learning at school (addition facts to 10, times tables, doubles, etc). Try to practice 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 if they can recall the fact.**
- **Play 'tennis' to practice 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 totaling 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 (-) 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 practice simple addition, multiples of 5 to practice 5 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= ? + ?). Repeat the activity with subtraction or multiplication.**
- **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 etc). Add to list over the next few days.**

Shapes and Measures 

- **Choose a shape of the week e.g. cylinder. Look for this shape in your environment (tins, candles etc). Ask your child to describe the shape to you (2 circular faces, 1 curved face …)**
- **Play 'guess my shape'. You think of a shape. Your child asks you questions to try to identify it but you can only answer 'yes' or 'no' (e.g. Does it have 4 corners?).**
- **Hunt for right angles around the home. Can your child spot angles bigger or small than a right angle?**
- **Look for symmetrical objects. Help your child draw and paint symmetrical patterns/pictures.**
- **Make a model using different shaped/sized boxes and containers. Ask your child to describe what they have made.**
- **Practise measuring the lengths or heights of objects (in metres and cm. Help your child to use rules and tape measures correctly. Challenge them to estimate before measuring.**
- **Let your child help with cooking at home. Help them to measure ingredients accurately using weighing scales or measuring jugs. Talk about what each division on the scale stands for.**
- **Choose different items and encourage your child to put the objects in order by weight, by feel alone. Check by looking at the amounts of the packets.**
- **Practise telling the time with your child. Use both digital and analogue clocks. Ask your child to be the 'timekeeper' (tell me when it's half past as the cakes will be ready).**

Make Maths fun!!!