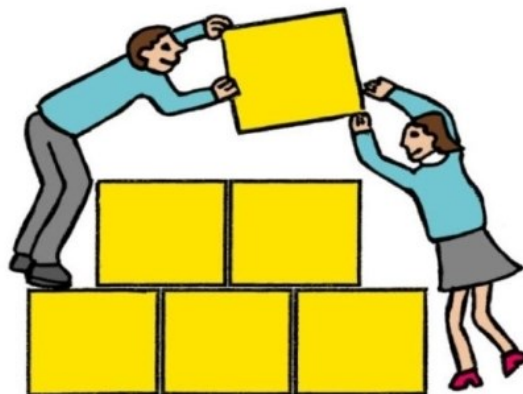
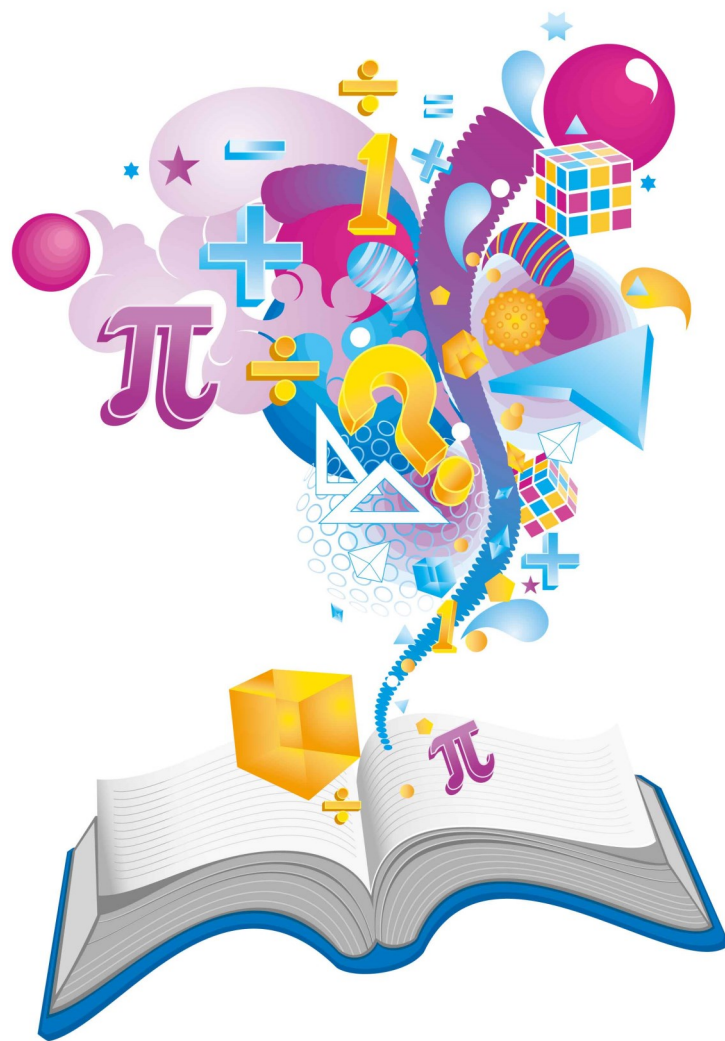


# How to help your child with maths



## CALCULATION



The maths 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, they are only encouraged to use these methods for calculations they cannot solve in their heads or by using known facts to help them.

Discussing the efficiency and suitability of different strategies is an important part of maths lessons.

**Talk to your child  
about how you work  
things out.**

**Ask your  
child to  
explain  
their  
thinking.**

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

Can I do this in my head?

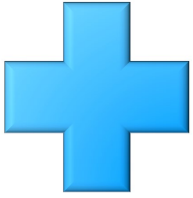
Could I do this in my head using drawings or  
jottings to help me?

Do I need to use a written method?

Should I use a calculator?



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



## 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. How many cakes did we eat altogether?



Children could draw a picture to help them work out the answer.

$7 + 4 = ?$

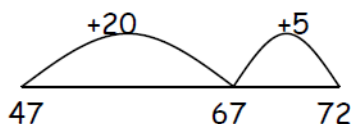
7 people are on the bus. 4 more get on at the next stop. How many people are on the bus now?



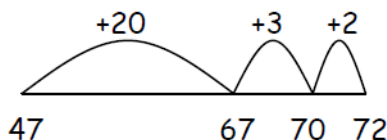
Children could use dots or tally marks to represent objects (quicker than drawing a picture).

$47 + 25 = ?$

My sunflower is 47cm tall. It grows another 25cm. How tall is it now?



or



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..

## ADDITION



$$\underline{487 + 546 = ?}$$

There are 487 boys and 546 in a school. How many children are there altogether?

$$\begin{array}{r} 546 \\ + 487 \\ \hline 13 \\ 120 \\ \hline 900 \\ \hline 1033 \end{array}$$

Children will be taught written methods for those calculations they cannot do 'in their heads'. Expanded methods build on mental methods and make the value of the digits clear to children. The language used is very important (6+7, 40+80, 500+400, then 900+120+13 : add this mentally)

$$\underline{12,786 + 2,568 = ?}$$

12,786 people visited the museum last year. The numbers increased by 2,568 this year. How many people altogether visited this year?

$$\begin{array}{r} 12786 \\ + 2568 \\ \hline 15354 \\ \hline \end{array}$$

1 1 1



When children are confident using the expanded method, this can be 'squashed' into the traditional compact method.



## SUBTRACTION

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

$5 - 2 = ?$

I had five balloons. Two burst. How many did I have left?



Drawing a picture helps children to visualise the problem.

Take away.

A teddy bear costs £5 and a doll costs £2. How much more does the bear cost?



Find the difference.

$8 - 3 = ?$

Grandad baked some gingerbread men. I ate 3. How many were left?



Using dots or tally marks is quicker than drawing a detailed picture.

Take away.

Ellen has 8 felt tip pens and Tim has 3. How many more does Ellen have?

Find the difference.

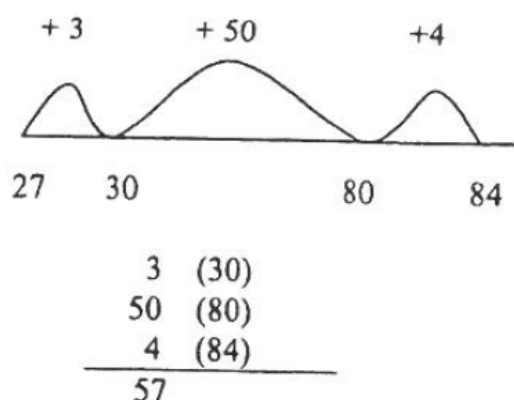


# SUBTRACTION



## $84 - 27 = ?$

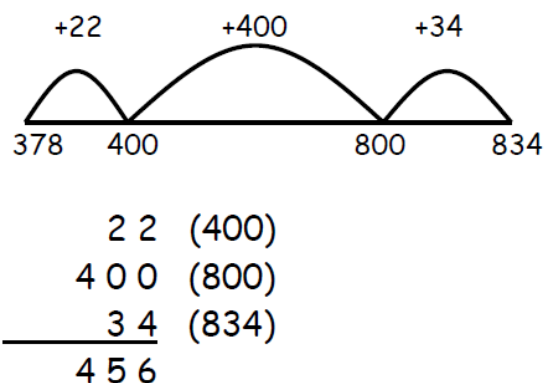
I cut 27cm off a ribbon measuring 84cm. How much is left?



Children could count on using an empty number line. This is a really good way for them to record the steps they have taken. The steps are then recorded vertically. For more information see the next example!

## $834 - 378 = ?$

The library owns 834 books. 378 are out on loan. How many are there on the shelves?



Children could count up (from the smallest number to the biggest) using an empty number line. It is easiest to count up to a multiple of 10 or 100 (a 'friendly' number). The steps can also be recorded vertically. This method works really well with any numbers, including decimals!

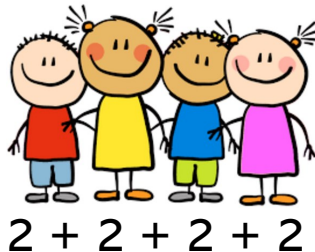


## MULTIPLICATION

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

$2 \times 4 = ?$

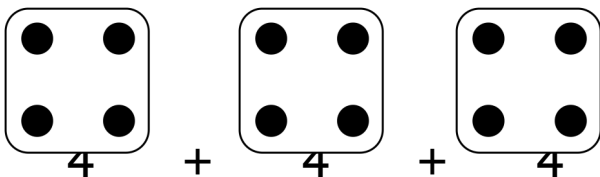
Each child has two eyes. How many eyes do four children have?



A picture can be useful when solving this problem.

$4 \times 3 = ?$

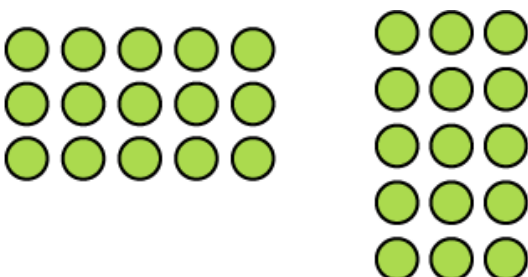
There are 4 cakes in a pack.  
How many cakes in 3 packs?



Dots or tally marks are often drawn in groups. This shows 3 groups of 4 or 4 three times.

$5 \times 3 = ?$

A sweet costs 5p. How much do 3 sweets cost?



Drawing an array (3 rows of 5 or 3 columns of 5) provides an image of the answer. It also helps develop understanding that  $5 \times 3$  is the same as  $3 \times 5$ .

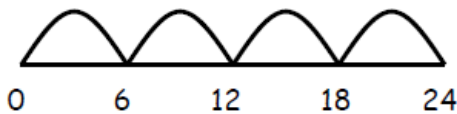


# MULTIPLICATION



$6 \times 4 = ?$

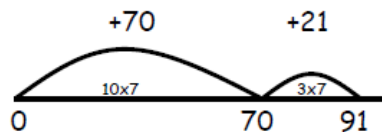
There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?



Children could count on in equal steps, recording each 'jump' on an empty number line. This shows 4 'jumps' of 6.

$13 \times 7 = ?$

There are 13 biscuits in a packet. How many biscuits in 7 packets?



When numbers get bigger it is inefficient to do lots of small 'jumps'. Split 13 into parts (10 and 3). This gives you two 'jumps' ( $10 \times 7$  and  $3 \times 7$ ).

$6 \times 124 = ?$

124 books were sold. Each book cost £6. How much money was taken?

$$\begin{array}{r|rrrr} & 100 & 20 & 4 & \\ 6 & 600 & 120 & 24 & = 744 \end{array}$$

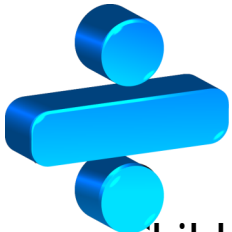
This is called the grid method. 124 is split into parts (100, 20, 4) and each of these is multiplied by 6. The three answers are then added together.

$72 \times 34 = ?$

A cat is 72cm long. A tiger is 34 times longer. How long is the tiger?

$$\begin{array}{r|rr} & 70 & 2 \\ 30 & 2100 & 60 \\ 4 & 280 & 8 \\ \hline & 2448 & \end{array} \quad \begin{array}{l} = 2160 \\ = 288 \\ \hline \end{array}$$

This method also works for 'long multiplication'. Again split up the numbers and multiply each part. Add across the rows, then add those two answers together.



## DIVISION

Children are taught to understand division as sharing and grouping.

$$6 \div 2 = ?$$

6 lollipops are shared between 2 children. How many lollipops does each child get? A picture can be useful when solving this problem.



Sharing between two.

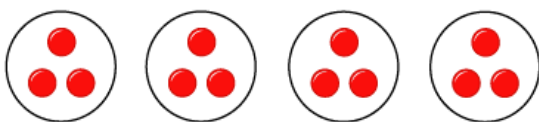
There are 6 lollipops. How many children can have two each?



Grouping in 2s.

$$12 \div 4 = ?$$

12 apples are shared equally between 4 baskets. How many apples are in each basket?



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

Sharing between four.

4 apples are packed in a basket. How many baskets can you fill with 12 apples?



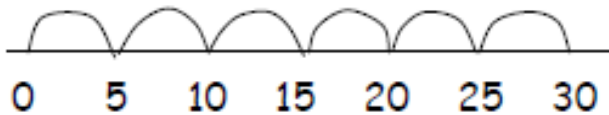
Grouping in fours.



## DIVISION

$30 \div 5 = ?$

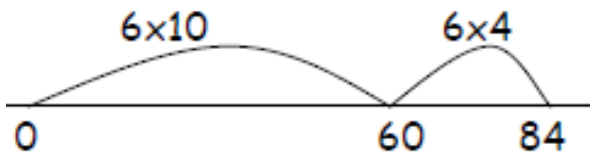
Sweets cost 5p each. How many sweets can I buy with 30p?



To work out how many 5s there are in 30, draw jumps of 5 along a number line. This shows you need 6 jumps of 5 to reach 30.

$84 \div 6 = ?$

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 6s to 84 so children can jump in bigger 'chunks'. A jump of 10 groups of 6 takes you to 60. Then you need another 4 lots of 6 to reach 84. Altogether, that is 14 jumps of 6.

$946 \div 35 = ?$

$946 \div 35 =$

$$\begin{array}{r} 946 \\ - 700 \text{ (20 lots of 35)} \\ \hline 246 \\ - 175 \text{ (5 lots of 35)} \\ \hline 71 \\ - 70 \text{ (2 lots of 35)} \\ \hline 1 \text{ (remainder)} \end{array}$$

This method is identical to that above but with numbers of any size including decimals.

Children need to think...

Can I make 10 groups of 35?

Can I make 20 groups of 35? etc.

It is easier for most children to 'chunk up' rather than subtract.

## 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.

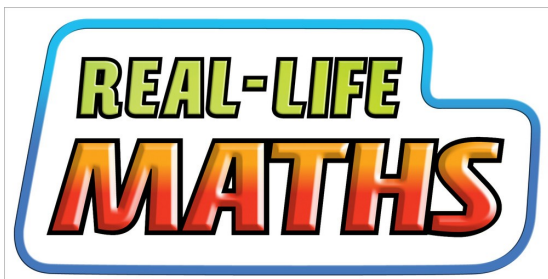
Plan an outing during the holidays. Ask your child to think about what time you will need to set off and how much money you will need to take.

Use a TV guide. Ask your child to work out the length of their favourite programmes. Can they calculate how long they spend watching TV each day/each week?

Use a bus or train 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 on a 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 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?

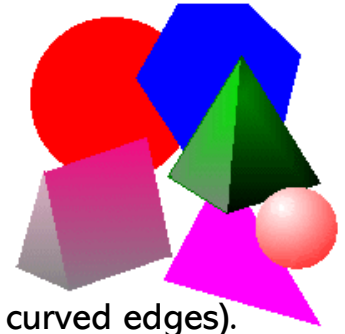
Use a set of playing cards (no pictures). Turn over two cards and ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in 2 minutes?

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.  $10 = 6 + 4$ ). 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 multiplication fact as well.

# SHAPE AND SPACE



Choose a shape of the week e.g. cylinder.

Look for this shape in the environment (tins, candles etc.).

Ask your child to describe the shape to you (2 circular faces, 2 curved edges).

Play 'guess my shape'. You think of a shape. Your child asks questions to try to identify it but you can only answer 'yes' or 'no' (e.g. Does it have more than 4 corners? Does it have any curved sides?)

Hunt for right angles around your home. Can your child also spot angles bigger or smaller than a right angle?

Look for symmetrical objects. Help your child to draw or paint symmetrical pictures/patterns?

Make a model using boxes/containers of different shapes and sizes. Ask your child to describe their model.

Practise measuring the lengths or heights of objects (in metres or cm). Help your child to use different rulers and tape measures correctly. Encourage 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 some food items out of the cupboard. Try to put the objects in order of weight, by feel alone. Check by looking at the amounts on the packets.

Practise telling the time with your child. Use both digital and analogue clocks. Ask your child to be a 'timekeeper' (e.g. tell me when it is half past four because then we are going swimming).

Use a stop clock to time how long it takes to do everyday tasks (e.g. how long does it take to get dressed?). Encourage your child to estimate first.

## Useful websites...



[BBC Bitesize Maths \(KS2\)](#): a combination of explanations and activities to help with all areas of maths

[Topmarks Maths](#): a selection maths games that work on computers and tablets

[Interactive Maths Games \(by Mandy Barrow\)](#): interactive activities to help with mental maths skills and SATs revision.

[Maths Zone](#): maths games and learning activities covering all topics on our maths curriculum

[Coolmath](#): maths games website for pupils with links of interactive and fun activities covering a wide range of maths topics

[Crickweb Numeracy](#): free online maths games resources for KS2 pupils

[National Numeracy Challenge](#) : free web-based tool designed to help adults boost their numeracy skills

[Stick & Split](#): an interactive game aimed at helping children develop a better understanding of multiplication and division

[Times Tables Rock Stars](#): interactive times tables questions based around becoming a rock star!

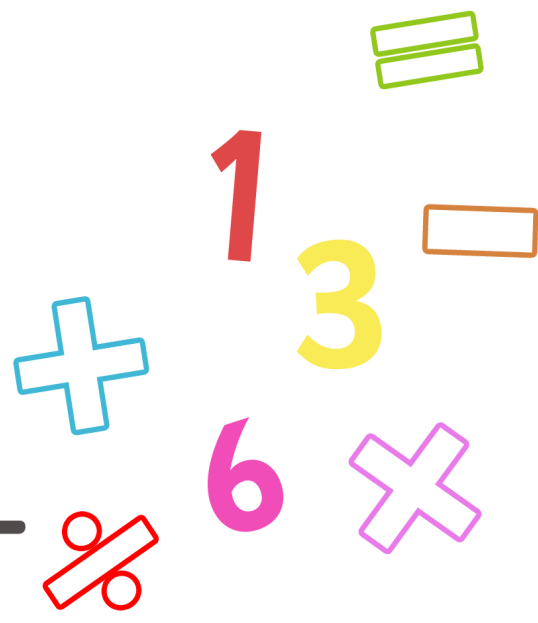
[Sumdog](#): interactive games that adapt to individual children focusing on different aspects of maths

[Prodigy](#): a game-based mathematical conquest where children solve problems as they explore an imaginary kingdom



## Key Vocabulary for... Addition and Subtraction

Add    Total    Make    Plus  
Sum    More    Altogether  
Difference    Leave    Subtract  
Difference between    Less  
Minus    Take away  
Mentally, Orally  
Column Addition  
Column Subtraction  
Estimate  
Inverse operation  
Solve problems  
Number facts  
Place Value  
Complex







## Key Vocabulary for...



### Multiplication and Division

Multiply Times Groups of  
Multiple of Multiplied by  
Lot of Repeated Addition  
Divided by Divide Share  
Divided into Share equally  
Equal groups of  
Estimate, Approximate  
Inverse Operation  
Calculate statements  
Multiplication tables  
Solve problems  
Positive integer

