Helping your child with Numeracy

MATHEMATICS AT BEN RHYDDING

We have prepared this guide to provide you with an overview of the teaching strategies for calculation: addition, subtraction, multiplication and division. It includes information about the expectations for learning times tables and practising 'Learn by Heart Targets'. These are basic facts and skills that enable children to work more quickly and confidently in Numeracy.

Is it 'Numeracy' or 'maths'?

The children learn to do the same things as we did at school in maths but the calculation methods now can be different and, as a result, so are some of the methods used to teach those maths skills.

How do we set out sums?

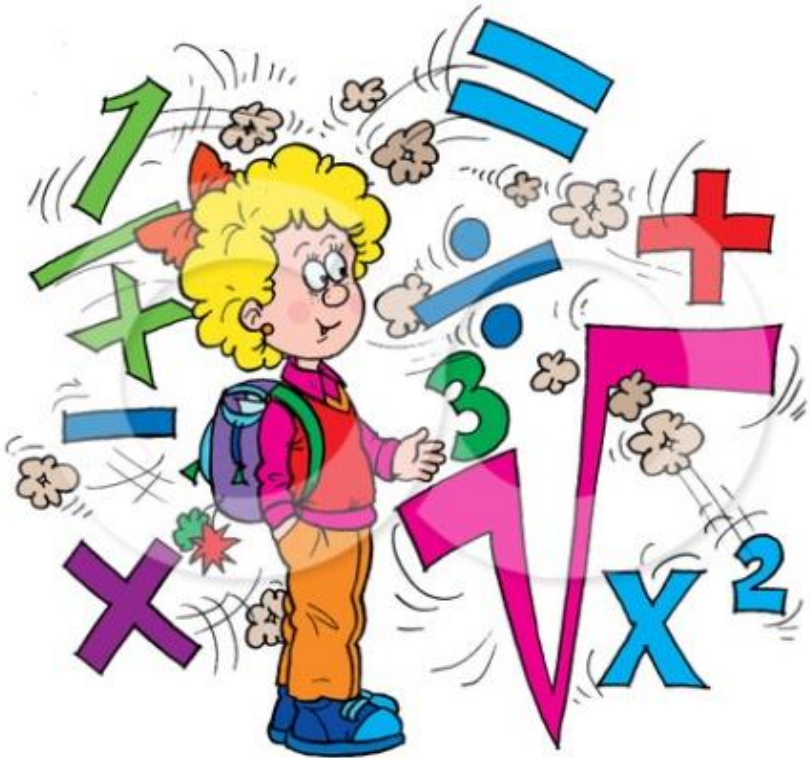
Younger children, up to Year 3 at least, will record calculations in a variety of ways that do not necessarily look like the kind of 'sums' you remember. More important is for children to understand the methodology behind a calculation and to be able to do that calculation 'in their heads' if possible. Where the numbers are too large, a clear method by which we can write it down aids the calculation. As children develop their knowledge and understanding through Years 3, 4, 5 and 6, teachers will be asking the children to look at any calculation and ask, "Can I do this in my head?" Sometimes this will need to be supported by a drawing, diagram or numerical jotting (notes). If they can't do it largely in their heads they should be looking for the most suitable written method or, during Years 5 and 6, using a calculator for more complex calculations.

Here we try, as simply as possible, to help you to help your children, from the earliest counting and mental skills to their recording of calculations and full written methods. At the end of the booklet, you will also find some activities that you can do with your child at home to help different areas of their mathematical development.

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

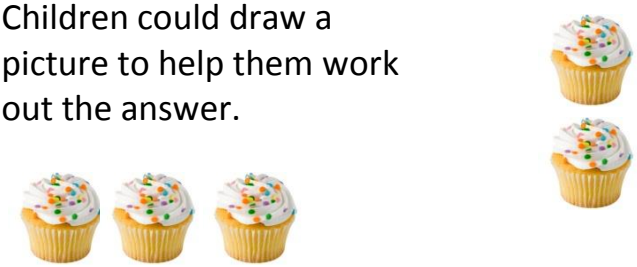
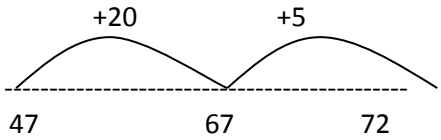
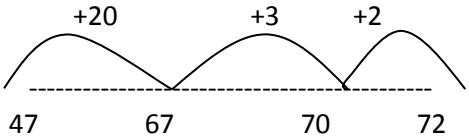
- Can I do this in my head?
- Could I do this in my head using drawings or jottings to help me?
- Do I need to use a written method? Which one?
- Should I use a calculator?

  Also help your child to estimate and then check the answer.
- Is the answer sensible?



ADDITION

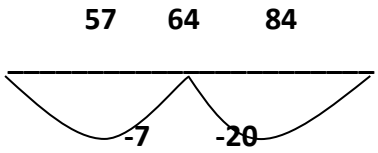
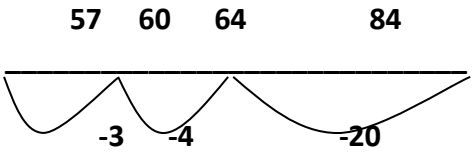
Children are taught to understand addition as 'combining two sets' and 'counting on'.

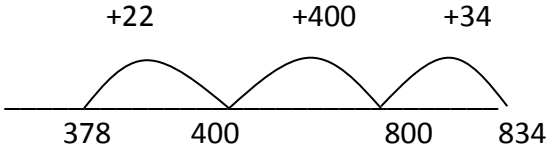
2+3= At a party, I ate 2 cakes and my friend ate 3. How many cakes did we eat altogether?	Children could draw a picture to help them work out the answer. 
8+4= 8 people are on the bus. 4 more get on at the next stop. How many people are on the bus now? ●●●●●●●●● ●●●● or I I I I I I I I I I I I	Children 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 a number line with the initial number 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

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? 1 2 7 8 6 + 2 5 6 8 1 5 3 5 4	The Formal Column Method. Starting by adding the ones (units) first, then tens, then hundreds etc.

SUBTRACTION

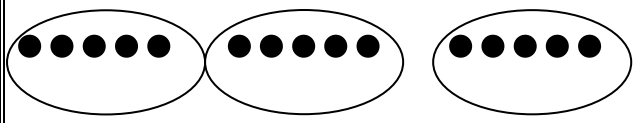
Children are taught to understand subtraction as taking away (counting back) and finding the difference (counting up)

5-2= I had five balloons. Two burst. How many did I have left?  Take away A teddy bear costs £5 and a doll costs £2. How much more does the bear cost?  Find the difference	Drawing a picture helps children to visualise the problem.
8-3= Mum baked 8 biscuits. I ate 3. How many were left? Take away ~~IIII~~ I I I I I Lisa has 8 felt tip pens and Tim has 3. How many more does Lisa have? ●●●●●●●●● ●●● Find the difference	Using dots or tally marks is quicker than drawing a detailed picture. The 'jumps' may be above or below the number for this method.
84-27= I cut 27cm off a ribbon measuring 84cm. How much is left?  or  	Children could count back using a number line with the initial numbers. This is a really good way for them to record the steps they have taken (start on 84, -20, then –7).

834-378= The library owns 834 books. 378 are out on loan. How many are on the shelves?  2 2 (400) 4 0 0 (800) 3 4 (834) 4 5 7	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! The jumps may be above or below the line for this method.
453 – 398 The cake shop had 453 cakes. At lunchtime 398 were bought. How many were left for the afternoon rush? $^{3}4^{14}5^{1}3$ 3 9 8 – 0 5 5	**The decomposition** method is another way to work out subtraction problems. Starting from the right and moving to the left. 3-8 we can't do so we need to take 10 from the next column to the left and make it into 13-8 which is 5. In the next column (tens) the 5 becomes a 4 because we took a ten. 4-9 we can't do so we need to take from the next column to the left and make it into 14-9 which is 5. In the hundreds column the 4 becomes a 3 because we took from here to make the 4 into 14. 3-3 is 0. The sum is complete.
£4.53 - £3.98 $^{3}4.^{14}5^{1}3$ 3 . 9 8 – 0 . 5 5 The answer is £0.55 or 55p	The decomposition method can also be used for decimal numbers, using the same working out.

MULTIPLICATION

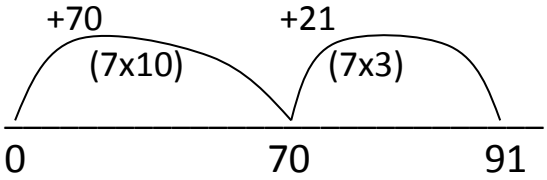
Children are taught to understand multiplication as repeated addition and scaling. It can also describe an 'array'.

2x4= Each child has two eyes. How many eyes do four children have?  2 + 2 + 2 + 2	Again a picture can be useful.
5x3= There are 5 cakes in a pack. How many cakes in 3 packs?  5 + 5 + 5	Dots or tally marks are often drawn in groups. This shows 3 lots of 5.
4x3= A chew costs 4p. How much do 3 chews cost? ●●● ●●● ●●● ●●● or ●●●● ●●●● ●●●●	Drawing an array of dots in rows or columns gives children an image of the answer. It also helps develop the understanding that 4x3 is the same as 3x4.
4x6= There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether? +6 +6 +6 +6 	Children could count on in equal steps, recording each jump on an empty number line. This shows 4 jumps of 6.

0 6 12 18 24

13x7=

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 (10x7 and 3x7).

6x124=

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

X	100	20	4
6	600	120	24

600 + 120 + 24 = 744

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

72x34=

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

X	70	2
30	2100	60
4	280	8

2100 + 280 + 60 + 8 = 2448

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.

79.8 x 24

X	700	90	8
20	14000	1800	160
4	2800	360	32

14000 + 1800 + 2800 + 360 + 160 +32 = 19152

answer = 1915.2

Another way to use the grid method is when using decimals. Take the decimal point out. Then split the numbers as you would for a Hundreds, Tens and Units sum (798 is split into 700, 90 and 8) then split the 24 (20 and 4). Complete the sum as you would for the grid method and then replace the decimal point in between the "ten" and "unit".

£19.99 x 23 £18.99 23 x $5_2 6_2 9_2 7$ $3_1 7_1 9_1 80+$ $4\ {}_1 3_1 6_1 77$	**The Formal Long Multiplication** method is another way of working out multiplication. Start with the unit column. 3x9=27, 7 down 2 to carry. 3x9=27, add the 2 to carry = 29, write down the 9 and carry the 2. 3x8=24, add the 2 to carry = 26, write down the 6 and carry the 2. 3x1 = 3 add the 2 to carry = 5 write down the 5. This row is complete. As you are multiplying in the tens column you put a 0 at the end of your row first (so you don't forget). Then complete this row using the same method. Then add the 2 rows to get your final answer, remembering to put back the decimal point in between the hundreds and the tens.

DIVISION

Children are taught to understand division as sharing and grouping.

6÷2=

6 lollies are shared between 2 children. How many lollies does each child get?

Sharing between 2

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

Grouping in 2's

More pictures!
Drawing often gives children a way into solving the problem.

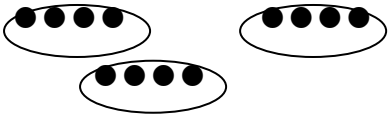
12÷4=

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

III	III
III	III

Sharing between 4

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

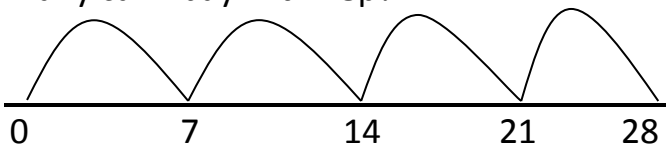


Grouping in 4's

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

28÷7=

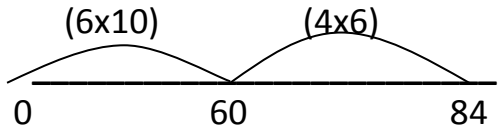
A chew bar costs 7p. How many can I buy with 28p?



To work out how many 7's there are in 28, draw jumps of 7 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?



Chunking Method

It would take a long time to jump in 6's to 84 so children can jump on in bigger 'chunks'.

A jump of 10 lots of 6 takes you to 60. Then you need another 4 lots of 6 to reach 84. Altogether, that is 14 sixes.

184÷7=

I need 184 chairs for a concert. I arrange them in rows of 7. How many rows do I need?

```
  1 8 4
- 1 4 0      x20
    4 4
-   4 2      x6
      2
        = 26 r2
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Chunking Next Step

In this example, you are taking away chunks of 7 but written in a column sum rather than a number line.

First subtract 140 (20 lots of 7) and you are left with 44.

Then subtract 42 (6 lots of 7), to leave 2.

Altogether, that is 26 sevens with a remainder of 2.

3678 ÷ 3 =

```
        1226
    3 | 3678
        3          3x1=3
        06-
         6         3x2=6
         07-
          6        3x2=6r1
          18-
          18       3x6=18
           0
```

Our "bus stop" method for Formal Long Division.

I have 3 and need to put it into groups of 3, how many groups have I got? 1. Put the 1 above the 3. 3x1=3 write this answer under the 3 and then take 3 away from 3 which leaves 0.

Bring down the 6. I have 6 and need to put them into groups of 3. How many groups have I got? 2. Put the 2 above the 6. 2 x 3=6 write this under the 6 and then take 6 away from 6 which leaves 0.

Bring down the 7. I have 7 …….. etc.

Carry on until you have no more numbers

	to bring down.
3678 ÷ 12 0306 r4 12 | 3678 0 12x0=0 36- 36 12x3=36 07- 0 12x0=0 78- 72 12x6=72 4 4 is left over.	As well as the “chunking” method, the “bus stop” method can also be used for bigger numbers.

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 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, 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.
- For more able children, chanting sequences with decimal numbers eg: 0.25, 0.50, 0.75, 1.00, 1.25 etc. or start with a negative number eg: -4, -2, 0, 2 etc.

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. For more able children you may want to use notes instead of coins.
- Buy some items with a percentage extra free helps 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 workout 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 workout 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.
- Discuss the temperature. The temperature today is 9°c, yesterday it was -2°c. What's the difference in temperature?

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' 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 of all of their numbers.
- 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, 6+3=9, 15+3=18). Add to the list over the next few days. Try starting with a x fact as well.
- Tell me as much as you can about the number …….. As long as the answer is the same as the number you have given, the list is endless. Eg: Tell me as much as you can about 49. It is a square number, half of 98, in the 7 times table, one sixth of 294. The answers your child gives will depend on their individual knowledge and ability.

SHAPES AND MEASURES

- 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? To stretch your child is it an obtuse (between 90 and 180 °) or acute angle (between 0 and 90°)?
- 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 centimetres). 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.

Please remember that every child is different and the method which suits one child may not suit another. Your child will be introduced to two different methods as and when their teacher feels it is appropriate. Please do not worry if your child does not use written methods, what matters is that they understand the method they are using and can carry out a calculation successfully and at their ability level.

Hopefully reading this has made you feel a little more confident and comfortable with numbers and current methods of calculation and therefore better able to help your child. If you are in any doubt about the method your child is, or should be using, ask them to try and explain. If they can't, please talk to their teacher or send in a note to let them know that there is a problem.
Remember if you have any concerns or questions it's always better to talk to your child's teacher rather than introducing different methods or worrying about what's going on. Children (and adults) need to feel confident with numbers and to enjoy playing with them and using them, that's really what it's all about. It then means using them for everyday purposes becomes a challenge and a joy rather than a worry.

If you wish to know any more about our policy on Written Methods, please make an appointment to see your child's class teacher.