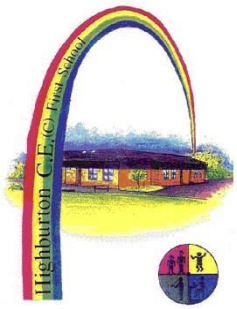
Shelley Pyramid
Family of First and Middle Schools

Calculations Booklet for Parents



Kirkburton Church of England First School

Gilthwaites First School

Denby C.E (VA) First School

Kayes First and Nursery School

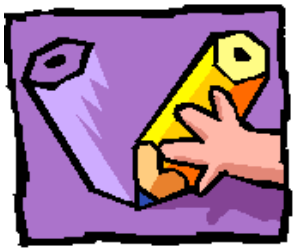
Shepley First School

Shelley First School

Birdsedge First School

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. From year 3 onwards formal written methods are introduced and these become as important as the mental strategies already in use.



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…

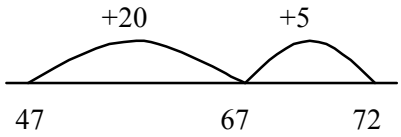
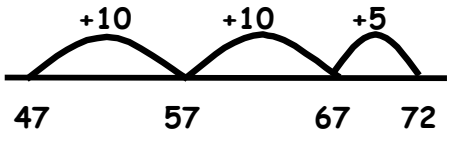
- Can I do this in my head?
- Could I do this in my head using drawings or jottings to help me?
- Do I need to use a written method?
- Should I use a calculator? **NO**, calculators should not be used by children at primary schools to solve mathematical problems.

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.

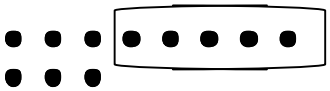
2+3= ☐ At a party, I eat 2 cakes and my friend eats 3. How many cakes did we eat altogether? 	Children could draw a picture to help them work out the answer
8+4= ☐ 8 people are on the bus. 4 more get on at the next stop. How many people are on the bus now?  or 	Children could use dots or tally marks 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 (e,g, for 47 + 25 start at 47 add on in steps of 10 then add the units figure = 47 + 10 + 10 + 5). This is much more efficient than counting on in ones.

ADDITION

487+546= □ There are 487 boys and 546 girls in a school. How many children are there altogether? 500 + 40 + 6 + 400 + 80 + 7 900 +120 + 13 = 1033	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 NOT in columns*).
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 1 1 1	When children are confident using the expanded method, this can be squashed into the traditional compact method.

SUBTRACTION

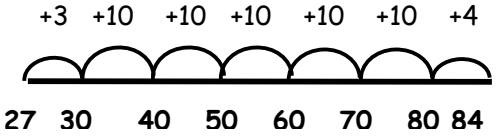
Children are taught to understand subtraction as taking away (counting back) and finding the difference (counting up)

5-2= ☐ I had five balloons. Two burst. How many did I have left?  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 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.

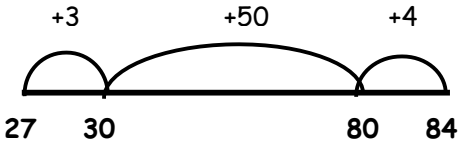
SUBTRACTION

84-27= □

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



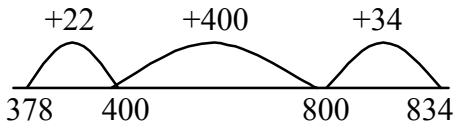
or



Children should count on using an empty number line. This is a really good way for them to record the steps they have taken. (E.g. for 84 – 27 start at 27 count on to the nearest 10 (30 a step of 3) then count on in steps of 10 (through 40, 50, 60, 70, 80 = 5 steps of 10) and then count on the remaining units figure (4 to reach 84) add the steps together to calculate the difference)

834-378= □

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



932 – 457 becomes

8 12 1
~~9~~ ~~3~~ 2
– 4 5 7
4 7 5

Children are encouraged to use a counting on method with larger numbers using a number line in Key Stage 1. The decomposition strategy is introduced during Key Stage 2.

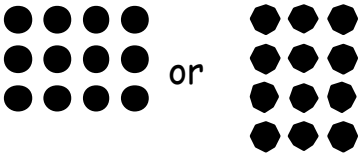
The language used must be very clear here.

The 3 tens become 2 tens so that the 2 ones become 12 ones (12 – 7 = 5).

The 9 hundreds become 8 hundreds so that the 2 tens can become 12 tens (12 tens, 120, - 5 tens, 50 leaves 7 tens, 70).

MULTIPLICATION

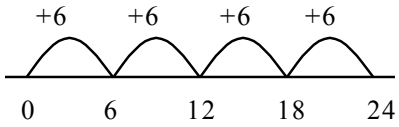
Children are taught to understand multiplication as repeated addition and scaling. It can also describe an array.

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 (3 rows of 4 or 3 columns of 4) gives children an image of the answer. It also helps develop the understanding that 4x3 is the same as 3x4.

MULTIPLICATION

6x4= ☐

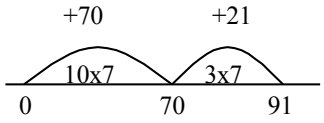
There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?



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

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).

6 x 38 =

Eggs are sold in boxes of 6. How many eggs are needed to fill 38 boxes?

	8	30
6	48	180

= (48 + 180) = 228

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

6 x 124 =

	4	20	100
6	24	120	600

= 744

(24 + 120 + 600) = 744

124 books were sold. Each book cost £6.00. how much money was taken?

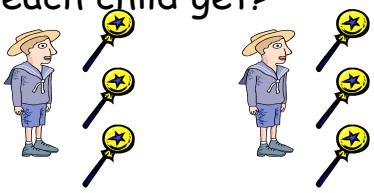
This method also works for 'long multiplication'. Again split up the numbers and multiply each part. Add across the rows, then add those two answers together.

DIVISION

Children are taught to understand division as sharing and grouping

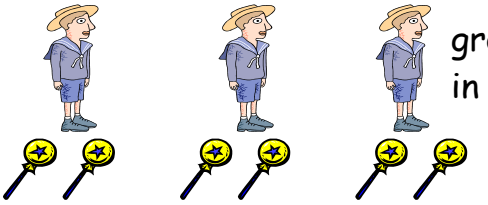
6÷2=☐

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?

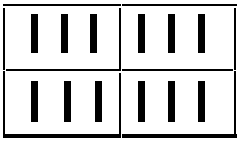


grouping in 2's

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

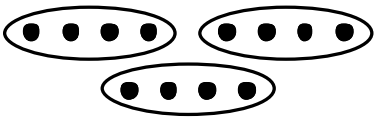
12÷4=☐

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



sharing between 4

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



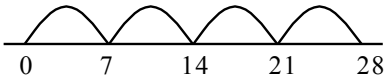
grouping in 4's

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

DIVISION

28÷7=☐

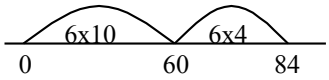
A chew bar costs 7p. How many can I buy with 28p?



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?



It would take a long time to jump in sixes 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?

```
  184
- 140   x20
   44
-  42   x6
    2
```

= 26 r2

This method is known as chunking. In this example, you are taking away chunks of 7. 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.

Higher calculation strategies for multiplication and division for children in Key stage 2.

38 x 7 =

30 8

x 7

56 *(7 x 8 = 56)*

210 *(7 x 30 = 210)*

266

38 x 7

3 8

x 7

5 6

2 1 0

2 6 6

128 teachers need 7 work books each by the start of the day. How many work books are required?

128 x 7 = ☐

1 2 8

x 7

8 9 6

1 5

Children use their partitioning knowledge in the expanded short multiplication strategy.

Children then use the compact short multiplication method (multiplying by 1 digit).

e.g. 23 x 7, 456 x 3, 6523 x 8

The long multiplication strategy is then introduced e.g. 23 x 19

396 ÷ 3 = ☐

The short division method is recorded like this

$3\overline{)396}$ → $3\overline{)300 + 90 + 6}$ (100 + 30 + 2)

This is then shortened to

$3\overline{)29^{2}1}$ (9 7)

Children are introduced to the short division strategy including remainders.

Place value is key here it is 2 hundred not 2 BUT the calculation method allows for the number to be called 2.

432 ÷ 5 becomes

$5\overline{)43^{1}2}$ (8 6 r 2)

Remember the importance of teaching placing a zero where there is no divisor.

612 ÷ 3

$3\overline{)61^{1}2}$ (2 0 4)

Short division is for calculations where children are dividing by 12 or less.

COUNTING IDEAS

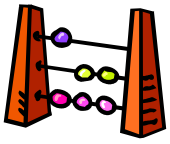
- Practise chanting the number names. Encourage your child to join in with you. When they are confident, try starting from different numbers - 4, 5, 6 . . .
- Sing number rhymes together - there are lots of commercial tapes and CD's available.
- Give your child the opportunity to count a range of interesting 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, 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.

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.

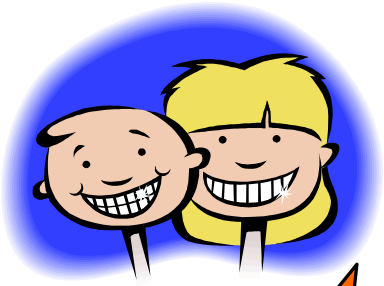
PRACTISING NUMBER FACTS



- 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 = □+□). 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 x fact as well.

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?
- 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.



Make maths fun!!

Give your child lots of praise and encouragement!

This booklet was developed by staff at
Cumberworth First School