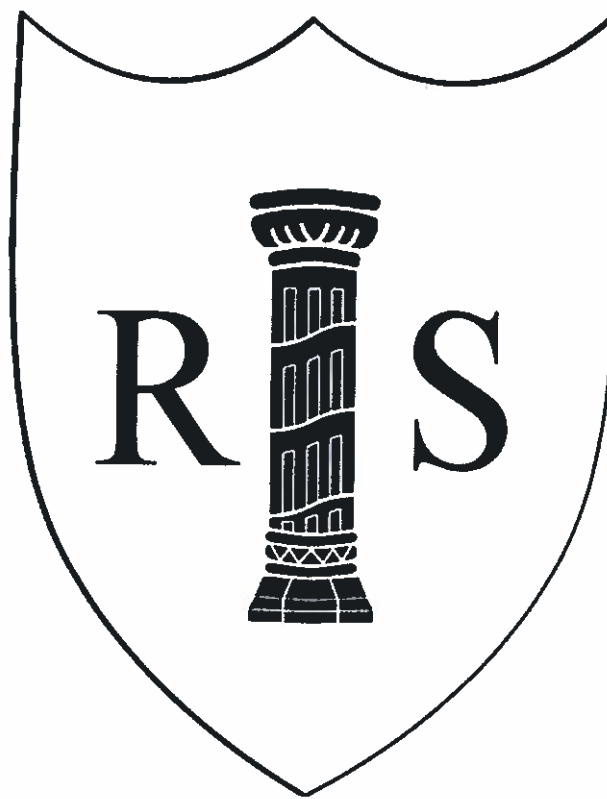


Roslin Primary School



Handy Maths Strategies

Calculations



A lot of emphasis in Numeracy teaching is placed on using mental calculations where possible, using jottings to help support thinking. As children progress through the school and are taught more formal written methods, they are still encouraged to think about mental strategies they could use first and only use written methods for those calculations they cannot solve in their heads. It is important that children are secure with number bonds (adding numbers together and subtracting them e.g. $10-6=4$, $13+7=20$) and have a good understanding of place value (ones, tens, hundreds, etc) before moving on to formal written methods.

- Can I do this in my head?
- Could I do this in my head using drawings or jottings to help me?
- Will a written method help me?
- Have I shown my working?
- Should I use a calculator?

In this booklet, you will find strategies that will help you support your child in using the 4 main number processes.



Addition

Drawing pictures

$2 + 3 =$

At a party, I eat two cakes and my friend eats three. How many cakes did we eat altogether?

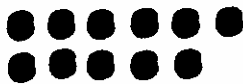


Dots or ten frames

Children could use dots or ten frames to represent objects.

$6 + 5 =$

Six people are on the bus. Five more people get on at the next stop. How many people are on the bus now?



Number lines

Children can count along using number line making jumps for each number. What is the total of the numbers on the dice?

$5 + 3 =$



Using fingers

$12 + 9 =$

12 birds are sitting on the grass. Nine more fly to join them. How many are there altogether?

Numbers greater than 10 can be worked with by holding the larger number in their head and counting on, using their fingers.



Hundred Square – See Appendix

$36 + 10$

I have 36 coloured pencils. If I buy 10 more, how many do I have now?

Children can be encouraged to imagine a 100 square. 10 more would be the number in the row below. Encouraging children to count in tens from any starting number is a good way to build this strategy.

36	37
46	47

Addition

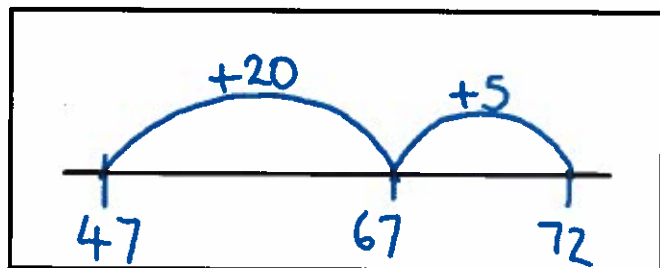


Empty Number Line

Drawing an empty number line helps children to record the steps they have taken in a calculation. Start on 47, +20, +5. This is more efficient than counting on in ones. Empty number lines can be used with numbers of any size.

My sunflower is 47cm tall. My friend's is 25cm taller. How tall is my friend's sunflower?

$$47 + 25 = 72$$



Vertical Calculation (Chimney sums)

	<u> t u </u>		<u> t u </u>
	40		47
+	<u> 25 </u>	+	<u> 25 </u>
	<u> 65 </u>		<u> 72 </u>
			1

Partitioning

By partitioning (splitting) both numbers into tens and ones, each part can be added separately and then the answers combined to give the total.

$$(80 + 60) + (7 + 4)$$

$$140 + 11$$

$$= 151\text{cm or }1.51\text{m}$$

One shelf measures 87 cm and another shelf measures 64cm. What is their total length in cm and m?

Addition



Extended Form

There 487 boys and 546 girls in a school.

How many children are there altogether?

$$487 + 546 =$$

HTU	OR
546	
<u>+487</u>	$546 + 487 = 900 + 120 + 13$
900	$= 1033$
120	
<u>+ 13</u>	

Learners are taught the importance of placing digits with the same value underneath each other in clear columns.

$$\begin{array}{r}
 \text{h t u} \\
 199 \\
 + \quad 123 \\
 \hline
 322 \\
 11
 \end{array}$$

Th H T u

I have 3479 yellow sweets and 2786 red sweets.

How many altogether?

$$\begin{array}{r}
 \text{Th H T u} \\
 3479 + 2786 =
 \end{array}$$

$$\begin{array}{r}
 3479 \\
 +2786 \\
 \hline
 6265 \\
 111
 \end{array}$$

Multiplication

Children are introduced to the idea of 'times tables' once all of the basics have been thoroughly covered. This way children have the ability to work out **any** multiplication problem without knowing tables. However, a good knowledge and quick recall of times tables is essential to children's mathematical progress. Children at First Level are taught 2, 3, 4, 5 and 10 times tables. When learning tables, children are taught to look for patterns. Children are also taught the relationship with division in fact families. If they know that $3 \times 6 = 18$, they also know that $6 \times 3 = 18$. Therefore $18 \div 3 = 6$ and $18 \div 6 = 3$.

Daily practise once children have begun to learn their tables is helpful in embedding knowledge for future mathematical problems.

Repeated addition

This shows multiplication as **repeated addition**.

$$2 \times 4 =$$

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



Grouping

Children can be encouraged to draw **groups**.

$$5 \times 3 =$$

There are 5 cakes in a pack. How many cakes are in 3 packs?



Arrays

Drawing an **array** - 3 rows of 4 or 4 rows of 3. It helps build the understanding that 4×3 is the same as 3×4 .

$$4 \times 3 =$$

There are 4 children in each group.

There are 3 groups. How many children are there altogether?

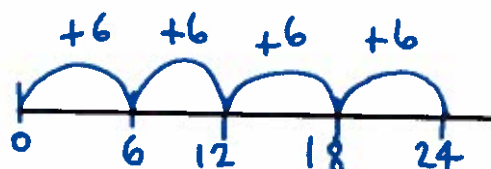


Skip counting

Children can use **skip counting** to count on in equal steps using a number line.

$$6 \times 4 =$$

There are 4 cats each with 6 kittens. How many kittens are there altogether?



Multiplication

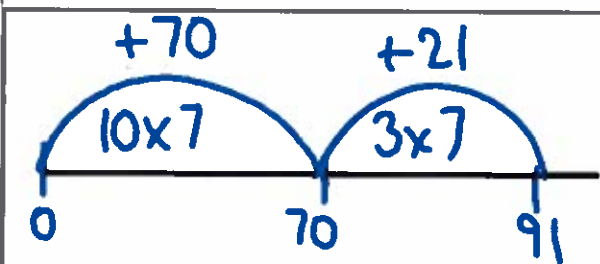


Partitioning

When multiplication goes beyond standard times table facts, it is inefficient to do lots of repeated addition. It is much easier to partition (split) 13 into 10 and 3. The calculation can be worked out on a number line or horizontally.

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

$$13 \times 7 = 91$$



$$\begin{aligned} 13 \times 7 &= (10 \times 7) + (3 \times 7) \\ &= 70 + 21 \\ &= 91 \end{aligned}$$

$$\begin{array}{r} 13 \\ \times 7 \\ \hline 91 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 13 \\ \times 25 \\ \hline 65 \\ \hline 260 \\ \hline 325 \end{array}$$

Grid Method

x	20	4
6	120	24

24 is partitioned (split) into tens and ones. Each part is then multiplied by six. The answers are then added together mentally or set out vertically.

$$\begin{array}{r} 120 \\ + 24 \\ \hline 144 \end{array}$$

24 books were sold. Each book cost six pounds. How much money was taken?

Subtraction



Drawing pictures

Drawing a picture helps children to visualise the problem. The use of practical resources such as pegs, counters or bricks helps to model the problem.

$$5 - 2 =$$

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

Take away



I have 5 cakes and my friend has 2 cakes. How many more do I have?

Find the difference



Drawing dots or lines

Using dots or lines is quicker than drawing a picture.

$$8 - 3 =$$

We baked eight biscuits. I ate 3. How many were left?

Take away



Find the difference

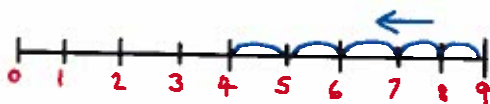


Number lines

A number line can also be used for counting on. $9 - 5 =$

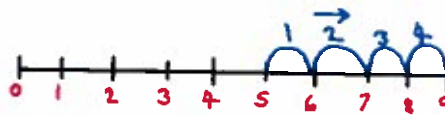
I had 9p and I spent 5p. How much do I have left?

Take away



Find the difference

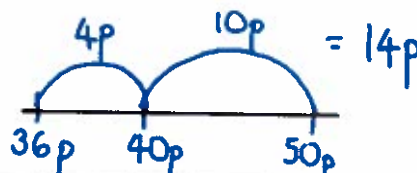
Use a number line to count or jump back.



Counting on using a number line is useful in calculating change.

$$50 - 36 =$$

I spent 36p. How much change do I get from 50p?



Subtraction

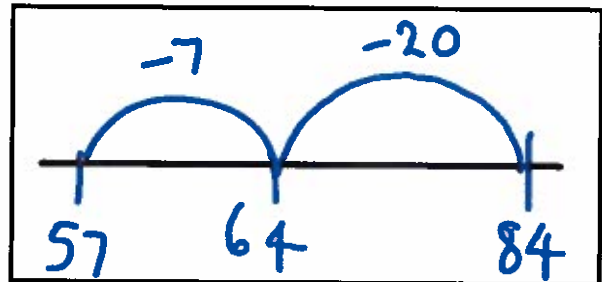


Counting Back using a number line

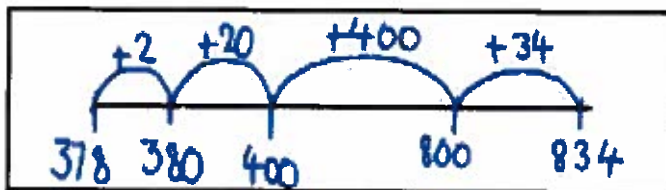
I cut 27cm off a ribbon measuring 84 cm. How much is left?

$$84 - 27 = 57 \text{ cm}$$

$$\begin{array}{r} \cancel{7} \cancel{8} \cancel{1} 4 \\ - \quad 27 \\ \hline 57 \end{array}$$



Counting Forwards Using a Number Line



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

$$378 + \underline{\quad\quad\quad} = 834$$

$$\begin{array}{r} \cancel{7} \cancel{8} \cancel{1} \cancel{4} \\ - \quad 378 \\ \hline 456 \end{array}$$

$$\begin{array}{r} 2 \\ 20 \\ 400 \\ + \quad 34 \\ \hline 456 \end{array}$$

Subtraction



Decomposition

$$\begin{array}{r}
 754 = 700 + 50 + 4 \\
 86 \quad \underline{80 + 6} \\
 \\
 = 700 + 40 + 14 \quad \rightarrow \quad 744 \\
 \quad \underline{80 + 6} \quad \quad \underline{86} \\
 \\
 = 600 + 140 + 14 \quad \rightarrow \quad 644 \\
 \quad \underline{80 + 6} \quad \quad \underline{86} \\
 \underline{600 + 60 + 8} \quad \quad \underline{668} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{c} 3 \quad 1 \\ \cancel{2} \quad 4 \quad 5 \quad 6 \end{array} \\
 - 1385 \\
 \hline
 1071 \\
 \hline
 \end{array}$$

6 ones minus 5 ones (units) is one.

It is not possible to subtract 50 from 80, so we must exchange 1 hundred for 10 tens, giving us 15 tens altogether.

Do this by scoring out the 4 and putting a 3 directly above the hundreds, then placing a 1 next to the tens at the top.

15 tens take away 8 tens leaves us with 7 tens which is recorded below.

Move on to the next 2 columns, where no exchanging is necessary— 3 hundreds minus 3 hundreds equal 0, and 2 thousand subtract 1 thousand is 1 thousand.

The final answer is 1071.

Division

Drawing pictures

Drawing pictures makes it easy to visualise the problem. Concrete materials can be used to model the question.

$$6 \div 2 =$$

Six sweets shared between 2 children. How many sweets does each child get?

sharing between 2



There are six sweets. How many children can have two each?

grouping in 2's

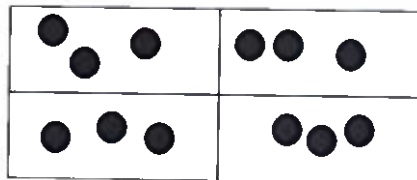


Drawing dots or using practical materials

Dots can be shared out one at a time or split into groups.

$$12 \div 4 =$$

12 apples are shared between four
How many apples are in each basket?



baskets.

Skip counting

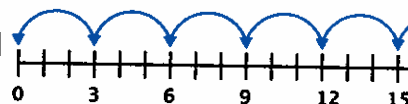
Children can use **skip counting** to count up in groups of three using their fingers.

$$15 \div 3 =$$

How many threes are in 15?



Children can draw these on jumps on a number line. This shows you need five jumps.



Using knowledge

Children can use their knowledge of multiplication to work out a division problem.

$$18 \div 3 =$$

There are 18 children on the school trip. Miss Bell asks them to get into groups of 3.
How many groups will she have?

I know that 3×6
is 18 so there
must be 6 groups.



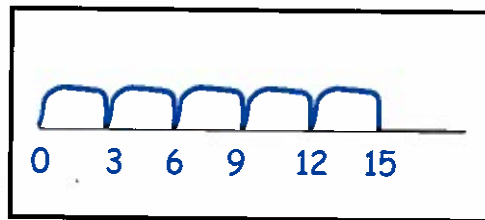
Division



Skip Counting

How many threes in 15?

$$15 \div 3 = 5$$



Short Division

Knowledge of Tables is very important

$$\begin{array}{r} 340 \\ 2 \overline{) 680} \end{array}$$

680 stickers must be shared equally between 2 classes. How many stickers does each class receive?

$$680 \div 2 = 340$$

Division



Short Division

- 2 can't be divided by 5 so the 2 is carried over to the next column, to become 25 hundreds.
- 5 into 25 goes in 5 times exactly, and is recorded on the top line.
- 5 goes into 6 once, with 1 remainder, which is carried over to make 15.
- 5 goes into 15 3 times exactly.

£2565 is split equally between 5 charities after a fundraising event. How much money does each charity receive?

$$\begin{array}{r} 513 \\ 5 \overline{) 2565} \end{array}$$

Useful Websites

www.mathsisfun.com

www.topmarks.co.uk/maths-games

nrich.maths.org/frontpage

www.mathplayground.com/

www.primaryhomeworkhelp.co.uk/maths/



Fun Apps

Time Tables by Cameraapps

Math Vs Zombies Free by TapToLearn

Tricky Maths by MyBrain

Math Maze by PT Sola Interactive

Flappy Math by LogicTravel

Sumdog by Sumdog Ltd

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Appendix 1

100 Square