KS1 Mental Maths Top Tips

Parent Booklet

(P3 & P4)

General Information

Mental Maths is a group of skills and strategies that allow us to do maths 'in our head' without using pencil and paper or a calculator. The ability to perform mental calculations is a key skill of being numerate and having the ability to apply this knowledge to everyday, real-life situations. Mental Maths can help children understand maths concepts better, manipulate numbers with confidence and calculate answers faster.

KS1 children at Ashgrove Primary are given daily opportunities to experience an engaging programme of mental maths activities. They are initially taught the strategies explicitly and then are given time and opportunities to develop and discuss which of the strategies they should use to calculate the answer to a wide range of questions and problems.

Which Mental Maths strategies are used in KS1?

Mental Maths Strategies

- Counting On and Back
- Reordering
- Inverse Operations
- Round and Adjust
- Partitioning
- Factors (Introduction to)

STRATEGIES

Counting On and Back (P1-P7)

This is the first to be taught and one of the most commonly used strategies in the junior school. Examples include:

- Counting on and back in 1s, 2s, 5s, 10s.
- Counting in 100s etc from any 2 or 3 digit number.

Reordering (P1-P7)

Reordering is used to make calculations easier by reordering the numbers to something that is nicer to calculate. We use this strategy for appropriate addition and multiplication sums. Examples of its use include:

- Addition or multiplication of 2 numbers
  - 9 + 3 is easier than 3 + 9 and they both have the same answer.
  - 2 x 4 is easier than 4 x 2 and they both have the same answer.
- When adding more than 2 numbers, such as 7 + 9 + 3 + 9 + 2 = ?
  - 9 + 9 (doubles) and 7 + 3 (numbers which make 10)
  - Reorder to 7 + 3 + 9 + 9 + 2 =
    So…. 10 + 18 + 2 = 30

Rounding and Adjusting (P2-P7)

This strategy is useful when adding or subtracting numbers that are close to a multiple of 10 or 100. This skill is initially explored by adding or subtracting 9 and 11.

+ 9 is the same as + 10 - 1	- 9 is the same as -10 +1
+ 11 is the same as +10 +1	- 11 is the same as -10 -1

So….
27 + 9 **is the same as** 27 +10 -1 because 9 is rounded to 10 and then adjusted by subtracting 1.

Likewise:

42 + 11 =	**is the same as**	42 + 10 + 1 =
27 – 9 =	**is the same as**	27 - 10 + 1 =
42 - 11 =	**is the same as**	42 - 10 - 1 =

Rounding and adjusting can also be useful in multiplication:
4 packets of cornflakes at £1.99 = £7.96
= £1.99 x 4
= £2 x 4 **- 4p** (because the £1.99 is rounded to £2 4 times, the equation then needs to be adjusted by subtracting this 4p)

Partitioning (P2-P7)

This strategy breaks numbers up into parts that are easier to work with (into tens and units for example). This makes calculating the answer mentally, much easier and faster.

e.g. 46 + 23 = (Only partitioning one number)

46 + 20 + 3 = 66 + 3 = 69

OR

46 + 23 = (Partitioning BOTH numbers)

40 + 6 + 20 + 3 = 60 + 9 = 69

Inverse Operations (P3-P7)

*This strategy uses the relationship that **+ is the inverse of –** and **x is the inverse of ÷**. This is used a lot in the teaching of number bonds and then in table facts. It is also useful when looking at the concept of half and double.*

E.g. 14 – ____ = 4 SO 4 + ____ = 14

2 x ____ = 8 SO 8 ÷ 2 = ____

This is a very useful strategy when a large number is being taken away from another number. So rather than counting all the way down, the inverse can simplify things immensely.

E.g. 55 – 47= ____ We can think of this as 47 + ___= 55

It is also very useful for money calculations where finding change can be worked out by counting on:

I buy an ice-cream at 74p. How much change do I get from £1

74p + ? = 80p

80p + ? = £1

Factors (P3-P7)

Children are introduced to doubling and halving numbers.

When multiplying, knowing how to double and halve numbers can be a useful strategy to help with mental calculations.

E.g. 12 x 4 is the same as 12 x 2 x 2 = 48 or 24 x 2 = 48

KNOWLEDGE AND UNDERSTANDING OF THE NUMBER SYSTEM

By the end of KS1 children should....

- Be able to read, write and order numbers to 1000 and know the value of each digit, including 0 as a place holder.
- Recognise, understand and use odd and even numbers.
- Understand that addition and subtraction are inverse operations.
- Understand that multiplication and division are inverse operations.
- Understand the relationship between fractions and division.
- Choose appropriate operations and apply mathematical skills to solve word problems, explaining methods and reasoning.

QUICK RECALL

As the children move their way through school, they will come across increasingly more complex ideas and concepts. By developing quick and accurate recall early on, they will be able to devote their energy to comprehending new curriculum content, rather than basic arithmetic.

By the end of KS1, children should have a quick mental recall of...

- Addition and subtraction facts up to 20 (number bonds).
- Doubles of all numbers to 10 (P3) and to 20 (P4) as well as their corresponding halves. (Double 14 = 28, half 28 = 14)
- All pairs of multiples of 10 with a total of 100
  (10 + 90 = 100, 20 + 80 =100 etc)
- All pairs of multiples of 100 with a total of 1000
  (100 + 900 = 1000, 200 + 800 =1000 etc)
- Multiplication facts for 2, 3, 4, 5 and 10 times tables.
- Division facts corresponding to multiplication facts.
  For example:

  4 x 2 = 8
  2 x 4 = 8
  8 ÷ 2 = 4
  8 ÷ 4 = 2

ROUNDING AND ESTIMATING

It is important that children can use rounding appropriately to help them get a feel for how many items there are. They do this by rounding and estimating.

Practical examples of this include estimating the numbers of biscuits in a packet, beans on a plate, sweets in a jar etc.

Then after making an estimate, children can see how close they were by counting the items.

Rounding and estimating can be used during calculations too. By rounding numbers to the nearest 10 and 100 (by the end of KS1) children can use this skill to help them make sensible estimates for calculations.

E.g. 42 - 13 is roughly 40 – 10

59p x 2 is roughly 60 x 2

This can then be applied to problems such as:

If I have £1 and crisps cost 29p would I have enough to buy 4 packets?

- First round 29p to 30p.
- 30p x 4 = 120p so I know I don't have enough money.

MENTAL CALCULATIONS

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

- Can I do this in my head? (Quick Recall)
- Which Mental Maths Strategy could help me?
- Which operation(s) do I need to use? (Knowledge and Understand of Number)
- What will be a rough answer? (Rounding and Estimating)
- Do I need to use a written method?
- Is this a reasonable answer? (After completing the calculation)

Using the 100 Square

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

Counting in 2s (even numbers)
Counting in 2s (odd numbers)

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

Counting in 5s
Counting in 10s

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

-10 +10 -1 +1

-10 - 1 is the same as -11

-10 + 1 is the same as -9

74	75	76
84	85	86
94	95	96

+10 - 1 is the same as +9

+10 + 1 is the same as +11

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

When going down each column...
the units digit remains the same
and the tens digit increases by 1 each time.

When going across each row...
the tens digit mostly remains the same
and the units digit mostly increases by 1 each time.

How Can I Help? Practical Ideas and Activities

- Talk to your child about how you work things out.
- Ask your child to explain their thinking.
- Discuss alternative ways to get the answer.
- Challenge your child to consider whether the strategy they have used is the best for the task at hand or whether there is a better one to use.
- Encourage your child to use Doodle Maths and Tables every day.
- Make flashcards to learn basic facts and multiplication tables.
- Dice games:
    - Throw 2 or 3 dice then find the total (+), difference (-) or product (x) of the numbers.
    - Throw 3 dice. Then try to combine the numbers with different operations (+, - or x) to make a target number.

      E.g. 5 7 2 Target 19…….. (2x7) + 5 = 19
- Board games such as Snakes and Ladders to promote counting on and back.
- Playing games like Mystery Number (give your child clues or your child asks questions using mathematical language to see if they can find the number.)

  E.g. My number is 10 less than 37.

  Is your number between 20 and 30?
- Choose 3 different numbers from 1-9:

  E.g. 8 6 3

  Challenge your child to find as many different calculations as possible to fit this sum:

  □□ + □ =

  Such as 86 + 3, 36 + 8 etc

  This can be extended to choosing 4 numbers for these types of sums.

  □□+ □□ = □□□+ □ = □□□ - □ =

- Give your child the answer to a sum and then ask them to write 6 calculations with this as the answer.

  E.g. Answer target is 12

  Sums could be: 4 + 8, 16 - 4, 3 X 4, 24 ÷ 2

Activity Ideas

- **Games** such as

  Snakes and Ladders

  Ludo

  Snap

  Monopoly

  Connect 4

- **Websites** such as

  www.doodlelearning.com

  www.topmarks.co.uk

  www.ictgames.com

  www.bbc.co.uk/bitesize/subjects/zjxhfg8

- **Apps** such as

  Tynkr

  Bluebot

  Beebot

  Hit The Button

Credits

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