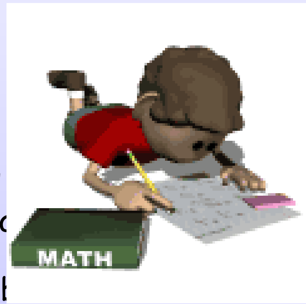
When faced with a calculation problem, encourage your child to ask.....

- 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 

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Encourage them to c

Is the answer sensi

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HELP YOUR CHILD WITH MENTAL MATHS

Key Stage Two

Primary 5, Primary 6 and Primary 7

By the end of Key Stage 2 children will have developed understanding of numbers up to 1 million.

They will be able to add and subtract whole numbers of any size.

They will be able to multiply whole numbers by any number up to 99 and divide whole numbers by a single digit.

They will have an understanding of fractions, decimals and percentages and their equivalences.

They will understand different types of numbers such as square, cube, triangular, prime and negative numbers.

They will be able to calculate shopping bills, change and %
discount.

MENTAL MATHS STRATEGIES WE USE

- Counting on/counting back including counting in decimals, fractions and below zero
- Re-ordering numbers to make the calculations easier
  - when adding several numbers

    9 + 14 + 9 + 6

  Look for numbers which make multiples of 10 → 14 + 6 = 20

  Look for doubles → 9 + 9 = 18 *so* 20 + 18 = 38

  - When multiplying

    5 x 18 is the same as 18 x 5

- *Rounding and adjusting*

  This strategy is useful when adding or subtracting numbers that are close to a multiple of 10, 100 or 1000:

  e.g. 870 + 190 is the same as 870 + 200 - 10

  (190 is **rounded** to 200 and then **adjusted** by subtracting 10)

  This strategy is also useful when multiplying:

  e.g. 7 packets of biscuits @ £1.95

  This can be calculated by rounding £1.95 to £2 multiplying by 7 (£2 x 7 = £14) and then adjust the answer by taking away 35p (7 x 5p)

  so £14 - 35p = £13.65

- *Partitioning*

  This strategy involves splitting a number into hundreds, tens and units:

  e.g. 470 + 220 is the same as 470 + 200 + 20
  520 - 150 is the same as 520 - 100 - 50

  In these calculations we keep the first number as it is and partition the second number. Sometimes it can be helpful to partition both numbers:

  e.g. 460 + 260 is the same as 400 + 200 + 60 + 60

  Partitioning is also very useful when multiplying:

  e.g. 76 x 3 is the same as (70 x 3) + (6 x 3)

- *Using Inverse Operations*

  This strategy involves using the relationship between addition and subtraction and also the relationship between multiplication and division:

  e.g. 2.0 - 1.7 → 1.7 + ☐ = 2.0

  41 ÷ 7 → 7 x 5 + ☐ = 41

  So 41 ÷ 7 = 5 rem 6

USEFUL LANGUAGE

percentage negative decimal

equivalences remainder quotient

mixed number simplify improper fraction

numerator square prime

denominator cube

hundredth tenth triangular

QUICK RECALL

During KS2 children work to develop quick recall of number facts which include:

- Multiplication facts for all times tables from 2 to 10 (P5)
- Division facts corresponding to tables of times 2 up to times 10 (P5)
- Fraction/decimal/percentage equivalences (P6/7)

e.g. $\frac{1}{4}$ = 0.25% = 25%

= 0.4 = 40%

- Square numbers up to 12^2

$\frac{2}{5}$

e.g. 7^2 = 7 x 7 = 49 (P6/7)

- Cubes of numbers 1 - 5 and 10 (P6/7)

e.g. 5^3 = 5 x 5 x 5 = 125

Children also need to be able to use their multiplication to help them work out division facts with remainders:

e.g. 27 ÷ 4

Knowing 4 x 6 = 24 helps them work out that 27 ÷ 4 = 6 rem 3

It is also important that children can use facts that are Quick Recall to work out new facts:

e.g. 8 x 3	=	24	*so*	80 x 3	=	240
9 x 7	=	63	*so*	90 x 70	=	6300
6 x 8	=	48	*so*	0.6 x 8	=	4.8

ROUNDING AND ESTIMATING

It is important that children can use rounding appropriately in order to estimate the answer to a calculation.

- Round numbers to the nearest:
    - 10
    - 100
    - 1000 to help make sensible estimates for calculations
- Round decimal numbers to the nearest whole number:

e.g. 17.6 → 18

- Examples of estimated calculations:

4982 + 3017 → 5000 + 3000 (8000)

61 x 88 → 60 x 90 (5400)

12.9 x 2.9 → 13 x 3 (39)

How many boxes of chocolates costing £3.99 can be bought with £20?

£20 ÷ £4 (5 boxes)

OTHER IDEAS

- Look at timetables
  - Ask your child to work out how long the journey between two places will take.
  - Use a TV Guide and work out how long a programme lasts.
- Shopping
  - Look at offers:

    e.g. If packets of biscuits in a "3 for 2" offer costs £1.20 per packet how much will a packet actually cost if you use this offer?
  - Biscuits cost £1.80. The cost is reduced by 25%. How much do the biscuits cost.
- Target Number
  - Choose 4 numbers e.g. 2 7 5 4

    Can you use these numbers to make a target number?

    e.g. 24 = (7 + 5) ÷ 2 x 4
  - Use mental strategies for keeping scores in a game of darts.

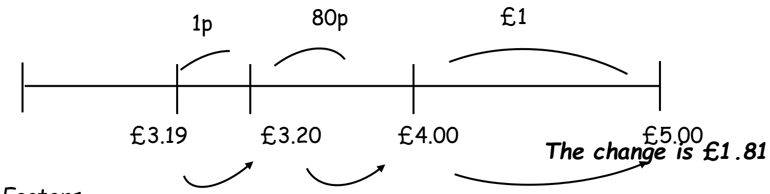
This strategy is also very useful in money calculations where finding change can be worked out by counting on:

e.g. I buy a sandwich at £3.19. How much change do I get from £5?

£3.19 + $\boxed{1p}$ = £3.20

£3.20 + $\boxed{80p}$ = £4.00

£4.00 + $\boxed{£1}$ = £5.00



- *Using Factors*

When multiplying knowing how to double and halve numbers can be very useful to help with mental calculations:

e.g. 33 x 4 is the same as 33 x 2 x 2 or 66 x 2 = 132

Using multiples of 10 as a factor of one of the numbers is also useful.

70 x 9 is the same as 7 x 10 x 9 or 63 x 10 = 630

- *Using Equivalence*

This strategy involves knowing the most suitable form of fractions, decimals or percentages to use for a calculation:

e.g 25% of £2.40 is the same as $\frac{1}{4}$ of £2.40 which can be calculated by halving and halving again

$\frac{1}{2}$ of £2.40 = £1.20 $\frac{1}{2}$ of £1.20 = 60p so $\frac{1}{4}$ of £2.40 is 60p

When working with percentages near the end of P6 and during P7 we encourage pupils to use mental strategies such as halving and dividing by 10:

e.g. to find:

10% → divide by 10

5% → divide by 10 and halve the answer

75% → halve the number (50%), halve it again (25%) and add the two answers together (50% + 25%)

90% → find 10% and subtract answer from original amount (100% - 10%)