HELPING WITH MATHS AT HOME
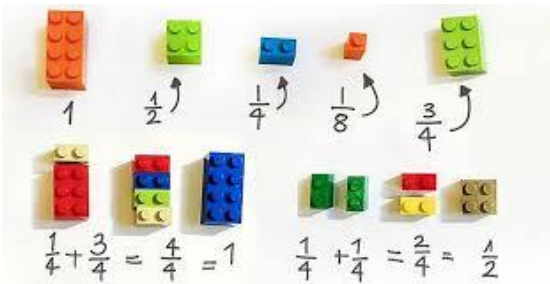
I ♥ maths

How can I work this out ?

PAULTON JUNIOR SCHOOL
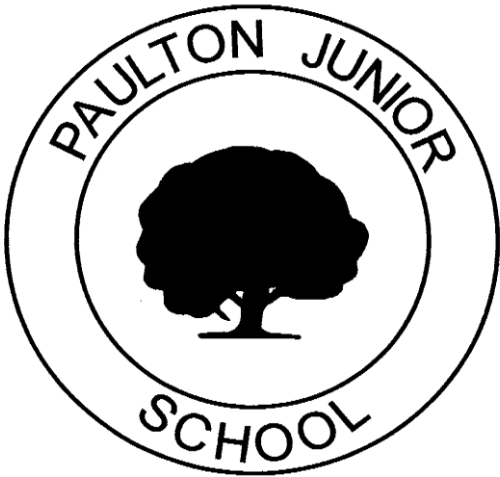
Multiplication Square

X	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

1 $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{3}{4}$

$\frac{1}{4} + \frac{3}{4} = \frac{4}{4} = 1$ $\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

Is there anything I can do at home, to help my child with their Maths work?

- Ask them to help you when you are calculating with money, measuring, weighing.
- Help them to learn their multiplication times tables.
  (All children, by the end of Year 4 must be able to recall their times tables.)
- Encourage your child to double and halve, find a fraction of a quantity, spot a pattern and talk about the shapes of objects in the environment.
- Tell the time and use timetables and maps.

In the later Primary Years, Key Stage Two, the children are encouraged to continue to use mental calculations, but will also be introduced to written methods. Please use the following examples and the suggested vocabulary when supporting your child at home. Hopefully, this will reduce any misconceptions and provide a consistent approach to learning.

Vocabulary

Partition
Rounding
Count on
Count back
Multiples of 10
Vertically
Horizontally
Calculations
Brackets
Add
Digits
Thousands Hundreds Tens
Units Times tables
Multiply
Grid method
Product

Place value
Subtract
Minus
Find the difference
Compact method
Ladder
Number line
Borrow
Carry over
Exchange
Total
Sum of
Decimal point
Remainders
Divide

Methods and strategies for the four rules

Addition using partitioning, horizontally.

45 + 37 = (40 + 30) + (5 + 7)
       = 70 + 12
       = 82

Partitioning= To separate the digits into their place values.
1. Separate the tens and units.
2. Add the tens inside one bracket and the units into another.
3. Add altogether to find the total.

Addition using partitioning, vertically.

```
4 5  +              3 4 6 +
3 7                 2 7 9
1 2  (7 + 5)          1 5
7 0  (40 + 30 )       1 1 0
8 2  (12 + 70)        5 0 0
                      6 2 5
```

To gain understanding of place value, partitioning is still used, but now the calculation is set out vertically with each digit in the correct column. The jottings at the side, in the brackets, remind your child of the numbers being added together. As they become more confident, they no longer need to be written down.

Addition, on a number line

86 + 57 = 86 + 50 + 7 = 143
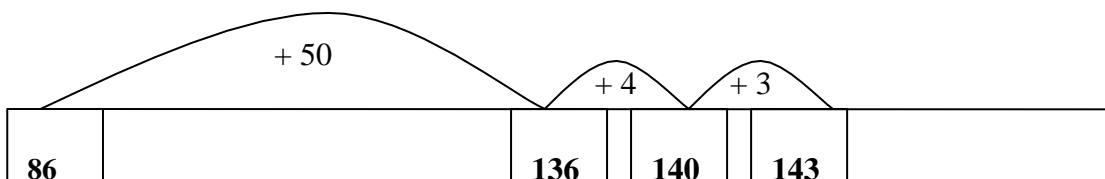
When adding on a number line it is important to start with the largest number and then add on the smaller number. Always partition the second number (50+7) and add on in multiples of 10. Complete the sum by adding on the remaining digits. Complete the sum by adding on the remaining digits.

Addition- Compact Method

| Without carrying | With carrying |

```
 4 3 5              4 5 3 +
 1 3 4 +            2 6 7
 5 6 9              7 2 0
                     1  1
```

Multiplication –

By the end of year 4, it is imperative that all pupils know their multiplication times tables off by heart (to 12x12). Your child's knowledge and understanding of the times tables need to be secure, then the process of solving these calculations, will be much quicker and achievable. The following pencil and paper methods will be taught to enable the children to work out long multiplication.

The partitioning method.

$38 \times 7 = (30 \times 7) + (8 \times 7)$

$\quad\quad = 210 + 56$

$\quad\quad = 266$

Partition the Tens and Units in 38. Place partitioned numbers inside their own set of brackets Multiply each number by the single digit. Find the value of each sum in the brackets. Add these answers together.

The Grid Method

38 x 7 =266

x	7
30	2 1 0
8	5 6
Total=	2 6 6

Partition the Tens and Units in 38. Place new numbers (30 + 8) in the grid as shown. Multiply the numbers across the grid. Place the answers Find the total, by adding these together.

54 x 22 = 1188

x	20	2
50	1 0 0 0	1 0 0
4	8 0	8
Totals=	1 0 8 0 +	1 0 8

```
 1 0 8 0 +
   1 0 8
 1 1 8 8
```

Multiplying, using the ladder method

```
4 5 x
  8
4 0    (8x 5)
3 2 0  (8 x 40)
3 6 0
```

These vertical methods show the expanded version so that the children can show their full understanding of the place value of each instruction. It is important that they continue to understand the value of each digit. Although we may say 8 x 4,the actual value of the 4 is 40.
Please encourage the use of the real value of the digits.

```
      4 6 3 x
        6 5
        1 5      (3x5)
      3 0 0      (5x 60)
  2 0 0 0 0      (5x 400)
      1 8 0      (60x 3)
    3 6 0 0      (60 x 60)
2 4 0 0 0 0      (60x 400)
2 6 4 0 9 5
        1
```

By the end of year 5, or when your child is secure in their understanding of place value, the shorter method of long multiplication will be encouraged.

```
7 8  x
  6
4 6 8
  4
```

```
6 4  x
  5 3
1 9 2
3 2 0 0
3 3 9 2
```

Always start in the units column. Work right to left. Encourage carrying the digits and recording them in a neat and concise place, as shown.

Division

All children will use their times table knowledge to work out the calculations used in division.

In year 3 the number sentences will look like this;

$24 \div 6 = 4$ or $29 \div 6 = 4$ remainder 5

When dividing a 3 digit number by a one digit number, then the children will need to use a more efficient method. This is called CHUNKING. It allows the children to continue to understand the importance of place value and also estimation. The method still relies on knowing your times tables, and requires the use of subtraction as well.

In year 5 the children are introduced to the short method and are required to ask 'how many 4s are in?'

$$
\begin{array}{r}
2\ 1\ 9 \\
\hline
4)\ \overline{8\ 7\ _36}
\end{array}
\qquad
\begin{array}{r}
2\ 1\ 2\ r\ 1 \\
\hline
4\ )\ 8\ 5_19
\end{array}
\qquad
\begin{array}{r}
2\ 1\ 4\ 7\ 5 \\
\hline
4\ )\ 8\ 5_19_30_20
\end{array}
$$

Later the decimal point is introduced into the question and also to enable the answer to be given as a remainder, in the context of the question.
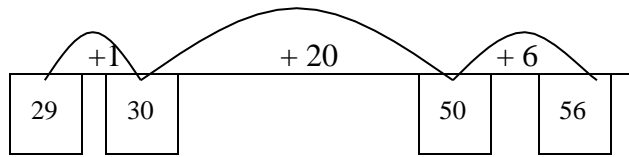
$$
\begin{array}{r}
1\ 3\ 2.\ 0\ 6 \\
\hline
7\ )\ 9\ 2\ 4.\ 4\ 2
\end{array}
$$

This week the sweet shop took £924.42
The average amount raised each day was £132.06.

Subtraction

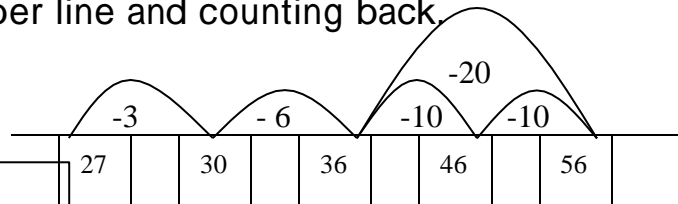## Subtracting, using a number line and counting on. (Frog)

5 6 – 2 9 = 2 7

| 29 | 30 | | 50 | 56 |

+1   + 20   + 6

Start at the smaller number and ask,
 'How many more do I need to get to ?
Round up, to the nearest multiple of
10. Count on in 10s
Count on the remaining units.

## Subtracting, using a number line and counting back.

5 6 – 2 9 = 2 7

-3   - 6   -10   -10

-20

| 27 | 30 | 36 | 46 | 56 |

Start with the larger
number.
Partition the smaller number-
tens and units; count back the
multiples of 10.
Rounding back to the lowest
multiple of 10.
Subtract the remaining units.
Which number have you landed on?

Subtracting vertically – counting on.

```
6 4 5 -
3 8 7
  1 3  ──→ 400
2 0 0  ──→ 600
  4 5  ──→ 645
2 5 8
```

+ 13   +200   + 45

| 387 | 400 | 600 | 645 |
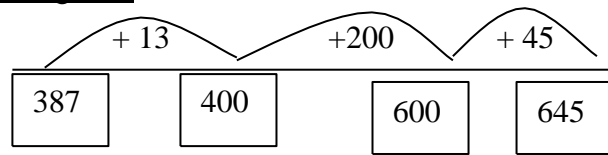
Start at the smallest number. Round up, to the nearest 100. Count on in 100s, until you reach the multiple of 100 in the larger number. Count on the remaining amount. Add the values to solve the calculation.

Subtracting- using the compact method

Without exchange

```
2 7 5 2 –
1 4 3 1
1 3 2 1
```

With exchange

```
3 4 16 7 12 3 1 0 -
  2 8 4 2
  1 8 8 8
```

When solving a word problem, your child may choose any of the suggested methods to work out the answer. Always encourage neat presentation of the written method as this will hopefully eliminate any careless errors.