

Mathematics in Higher Bebington Junior School

At Higher Bebington Junior School we place a very high priority on our pupils attaining skills and knowledge in mathematics. Over the four years that your child is with us we aim to enable them to develop, consolidate and practise their abilities in a wide range of different mathematical activities.

Mathematics is taught in daily Numeracy lessons of about an hour in length. The group is taught together for a high proportion of the time, and oral and mental work feature in each lesson.

Our regular maths homework aims to consolidate work undertaken in daily lessons.

The purpose of this booklet is to show some of the most important progressions from mental to written strategies in the four number operations (**addition, subtraction, multiplication and division**), as taught in our school. We hope that this will enable you to support your child with their development in mathematical skills and knowledge.

Strategies Used

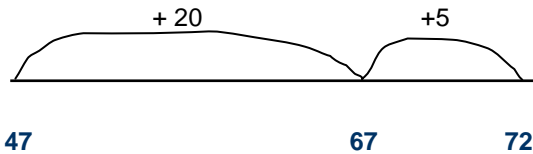
On the next pages you will see examples of some of the methods or strategies your child will use in school when calculating answers to mathematical questions. Although there is generally a logical progression from one strategy to another, it is important that a child does not move onto the next strategy until they are ready and confident to do so.



ADDITION

❖ Using a blank number line:

$$47 + 25 =$$



Using a blank number line helps children to record the steps they have taken in a calculation, in this example, start at 47, add twenty and then add 5

❖ Mental methods using *partitioning*:

$$\text{e.g. } 47 + 25 = (40 + 20) + (7 + 5)$$

$$= (60) + (12)$$

$$= 72$$

Partitioning numbers helps children with the accuracy of their calculation. First add the multiples of ten together and then add the units together, finally add both answers.

❖ *Partitioning with HTU*

$$\text{e.g. } 411 + 352 =$$

$$\begin{array}{r} 411 \\ \underline{352} + \\ 3 \\ 60 \\ \underline{700} \\ \underline{763} \end{array}$$

In the above example children add units together, then tens and finally hundreds to find three numbers that are then added to find a solution

❖ **Compact written method, adding the units first:**

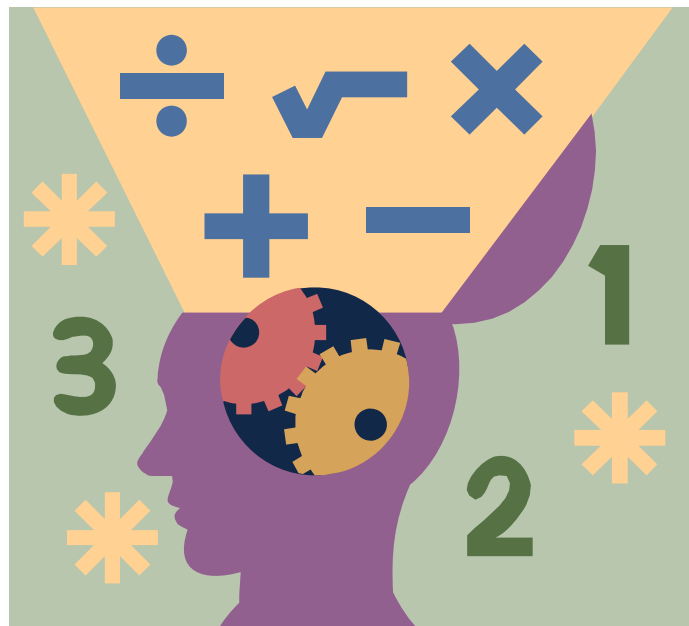
e.g.
$$\begin{array}{r} 47 \\ \underline{25} + \\ \color{red}{72} \\ \color{red}{1} \end{array}$$

Ensure that the children understand that the figure 1 'carried' from the units column is worth ten times more in the next column to the left.

$12\,786 + 2\,568 = ?$

$$\begin{array}{r} 12\,786 \\ \underline{2\,568} + \\ \color{red}{15\,354} \\ \color{red}{1\ 11} \end{array}$$

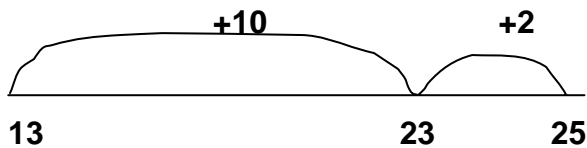
When using this 'compact method' children need to make sure that they have been accurate with *place value* and that each column lines up accurately.



SUBTRACTION

❖ Subtraction as "adding on" using a number line:

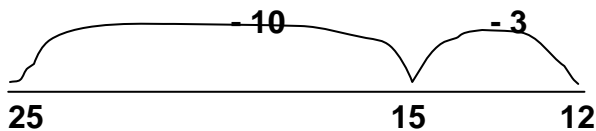
e.g. $25 - 13 = 12$



As with the number line used for addition, this method allows children to see the steps they have taken. It also emphasises that subtraction is the *inverse* (opposite) of addition

❖ Subtraction as "taking away" using number line:

e.g. $25 - 13 = 12$

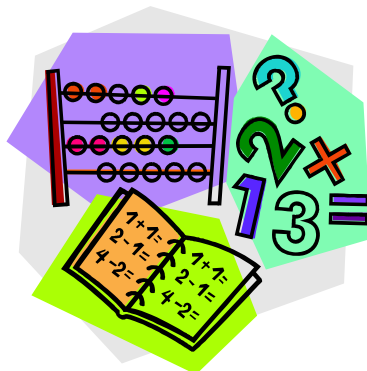


A number line helps children identify the most logical and simple ways to *partition* the number being subtracted. So, in this example ten is taken away and then another three.

❖ Subtraction using a compact method: e.g

$$\begin{array}{r} 7 \\ 81 \\ 57 - \\ \hline 24 \end{array}$$

This *decomposition* method involves *exchanging* a ten for ten units, which are added to the number in the units column. So, $11 - 7 = 4$ in the units column, and $70 - 50$ gives 20 in the tens column



MULTIPLICATION

❖ Multiplication as repeated addition:

e.g. $5 + 5 + 5 = 5 \times 3$ or 3×5

❖ Multiplication using Partitioning:

e.g. $23 \times 3 = (20 \times 3) + (3 \times 3)$ or $20 + 20 + 20 = 60$, $3 + 3 + 3 = 9$

$60 + 9 = 69$

This is later developed:

e.g. $38 \times 7 = (30 \times 7) + (8 \times 7)$
 $210 \quad 56$

By partitioning the larger number children can answer the question by adding together their two calculations.

$210 + 56 = 266$

❖ Grid layout (expanded method) :

38×7

X	30	8	
7	210	56	266

This is called the grid method. 38 is split into parts (30 and 8) and each of these is multiplied by 7. The two answers are then added together.

❖ Grid layout (for larger numbers) :

56×27

X	50	6	
20	1000	120	1120
7	350	42	392
			1512

❖ Expanded written method:

e.g. 38

$$\begin{array}{r} 7 \text{ x} \\ \underline{210} \quad (30 \times 7) \\ \underline{56} \quad (8 \times 7) \\ \hline 266 \end{array}$$

❖ Compact written method:

e.g.

$$\begin{array}{r} 38 \\ \underline{7} \text{ x} \\ \underline{266} \\ 5 \end{array}$$

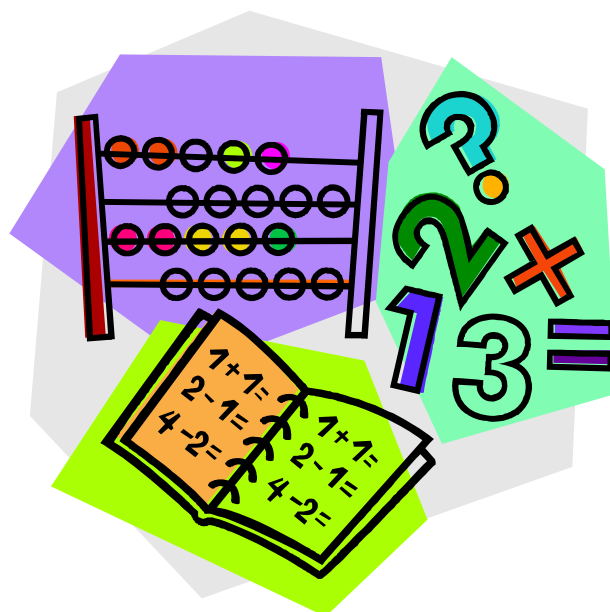
This method requires an understanding of *place value*. The number 5 which we have placed beneath the tens column is worth 50.

❖ Long multiplication method: 72 x 34

$$\begin{array}{r} 72 \\ \underline{34} \text{ x} \\ 288 \quad \text{x 4} \\ \underline{2160} \quad \text{x 30} \\ \hline 2448 \\ 1 \end{array}$$

Multiply first by the smaller number (72 x 4) and then by the multiple of ten (72 x 30)

Children need to be careful with *place value* when writing down the two answers to ensure accuracy



DIVISION

❖ Repeated subtraction:

e.g. $18 \div 6 =$

$$\begin{array}{r} 18 \\ - 6 \\ \hline 12 \\ - 6 \\ \hline 6 \\ - 6 \\ \hline 0 \end{array}$$

We have subtracted '6' three times so our **answer is 3**

❖ "Chunking" (subtracting multiples of the divisor)

e.g. $72 \div 5$

$$\begin{array}{r} - 50 \quad (10 \times 5) \\ \hline 22 \\ - 20 \quad (4 \times 5) \\ \hline 2 \end{array}$$

or

$$\begin{array}{r} 14 \text{ R } 2 \\ \overline{)72} \\ \underline{50} - (5 \times 10) \\ 22 \\ \underline{20} - (5 \times 4) \\ 2 \end{array}$$

They have taken away groups of '5' until they can take away no more groups. They are then left with a remainder

Answer = **14 R2**

❖ Chunking with larger numbers

$$924 \div 22$$

$$924 - 220 \quad (10 \times 22)$$

$$704 - 440 \quad (20 \times 22)$$

$$264 - 220 \quad (10 \times 22)$$

$$44 - 44 \quad (2 \times 22)$$

That is a total of 42 lots of 22, so **$924 \div 22 = 42$**

When children are more confident,

$$924 \div 22$$

$$924 - 880 \quad (40 \times 22)$$

$$44 - 44 \quad (2 \times 22)$$

Altogether we have used 42 lots of 22, so

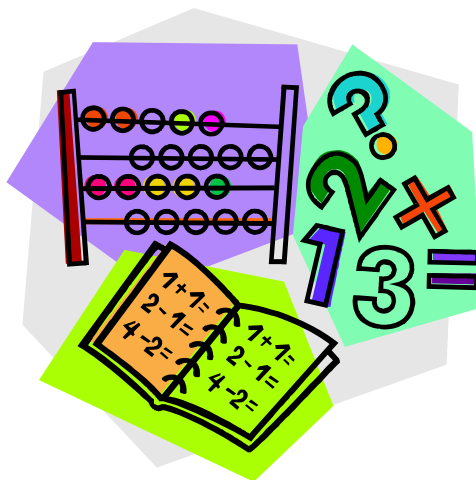
$$\underline{42} \times 22 = 924$$

❖ Compact Written Method

$$\begin{array}{r} 14R2 \\ 5 \overline{)722} \end{array}$$

❖ Compact Written Method (Long Division)

$$\begin{array}{r} 042 \\ 22 \overline{)924} \\ - 88 \quad \downarrow \\ \underline{044} \\ - 44 \\ \underline{0} \end{array}$$



Vocabulary

A selection of useful and important vocabulary (with simple definition) that your children will meet in their four years with us

Angle: A measure of turn. A quarter turn is called a **right angle**. A turn less than 90° is an **acute angle**, greater than 90° but less than a straight line is an **obtuse angle**, and an angle greater than 180° is a **reflex angle**.

Average (mean): The average is the amount that would be given to every person if all contributions were collected in and given out equally.

e.g. John has 12 pence

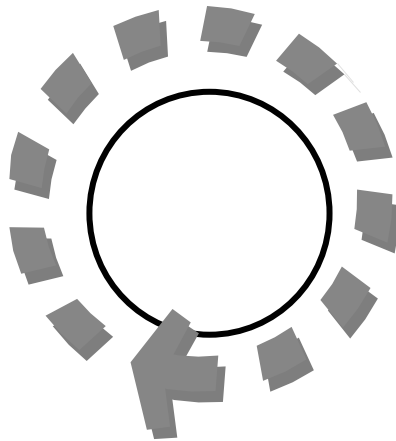
Mary has 4 pence

Paul has 5 pence

Total = 21 pence

When collected in and given out evenly each child would be given $21 \div 3 = 7$ pence

Circumference: The circumference of a circle is the distance all the way round the circle



Equilateral triangle: An equilateral triangle is a triangle with all three sides having the same measurement. Each angle is the same size (60°)



Factors: The factors of a number are the numbers that divide (or can be shared) exactly into another number.

The factors of 12 are 1, 2,3,4,6 and 12

Inverse: The inverse (opposite) of addition is subtraction [so, $12 + 8 = 20$ and $20 - 8 = 12$], and the inverse of multiplication is division [so $7 \times 6 = 42$, and $42 \div 7 = 6$]

Multiple: A multiple of a number is the number created as a result of multiplying it. Multiples of 5 are 5, 10, 15, 20, 25, 30 etc.

Perimeter: The distance measured around the outside of a flat shape (not a circle).

Perpendicular: Perpendicular means 'at right angles'. A perpendicular is a line that meets another line at right angles. The horizontal is perpendicular to the vertical and vice versa.

Prime Number: A prime number has only two factors, itself and one(1). Prime numbers are not ALL odd numbers

These are all prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 etc.

Product: The product of two or more numbers is the answer when you multiply them together.

The product of 5 and 3 is $5 \times 3 = 15$

Quadrilateral: Any four-sided shape

Square Number: A squared number is a number multiplied by itself.

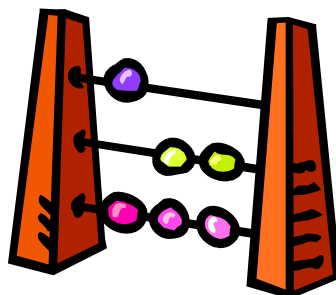
4 is the square number of two, because 2×2 (two squared) = 4

25 is the square number of 5, because 5×5 (five squared) = 25

Square Root: The square root of a number is the number that has been multiplied by itself (squared) to produce that number

The square root of nine is three because $3 \times 3 = 9$

The square root of twenty five is five because $5 \times 5 = 25$



Maths Targets

Year 3

By the end of Year 3, most children should be able to...

- Read and write numbers up to 1000 and put them in order, knowing what each digit is worth
- Count on or back in tens or hundreds from any number under 1000, e.g. 4562, 472, 482...or 462, 562, 662...
- Know by heart addition and subtraction facts to 20, e.g. $4 + 16 = 20$, $12 - 8 = 4$
- Work out in their heads sums such as $56 + 29$, and $97 - 51$
- Know by heart the 2, 5 and 10 times tables
- Do simple divisions, such as $27 \div 5$
- Find simple fractions, such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$, of shapes and numbers
- Tell the time to the nearest five minutes
- Use £.p. e.g. know that £2.04 is £2 and 4p
- Solve simple number problems and explain how to work them out
- Recognise right angles and lines of symmetry in simple shapes
- Explain a simple graph

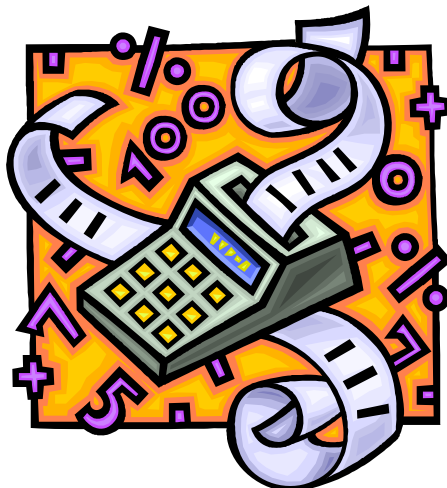


Maths Targets

Year 4

By the end of Year 4, most children should be able to...

- Know the 2, 3, 4, 5 and 10 times tables by heart, e.g. know facts like 7×5 and $36 \div 4$
- Round numbers like 672 to the nearest 10 or 100
- Work out that a simple fraction like $\frac{2}{6}$ is equivalent to $\frac{1}{3}$
- Work out sums like $26 + 58$ and $62 - 37$ in their heads
- Work out sums like $234 + 479$ or $791 - 223$ using pencil and paper and writing them in columns
- Multiply numbers like 38 by 10 or by 100, and divide numbers like 4200 by 10 or 100
- Multiply and divide numbers up to 100 by 2, 3, 4 or 5, and find remainders, e.g. 36×3 , $87 \div 4$
- Change pounds to pence and centimetres to metres, and vice versa, e.g. work out that £3.45 is the same as 345p, and that 3.5 metres is the same as 350 centimetres
- Tell the time to the nearest minute and use a simple timetable
- Pick out shapes with similar features, e.g. shapes with sides the same length, or with right angles, or symmetrical shapes
- Use +, -, \times , \div to solve problems and decide whether it is best to calculate in their head or on paper.

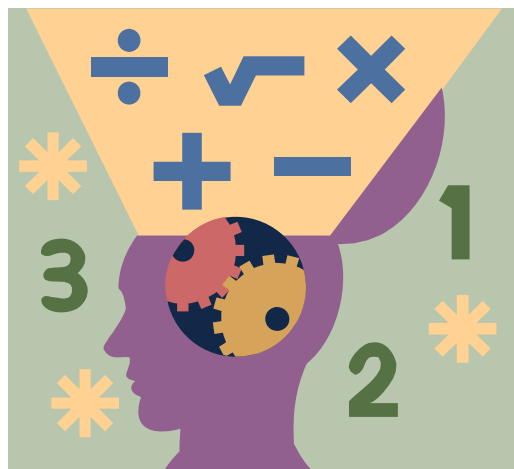


Maths Targets

Year 5

By the end of Year 5, most children should be able to...

- Multiply and divide any whole number up to 10 000 by 10 or 100
- Know what the digits in a decimal number stand for, e.g. the 6 in 2.63 stands for 6 tenths and the 3 for 3 hundredths
- Round numbers with 1 decimal place to the nearest whole number, e.g. 9.7 rounds up to 10, 147.2 rounds down to 147
- Use division to find a fraction of a number, e.g. find one fifth by dividing by 5
- Work out in their head the difference between two numbers such as 3994 and 9007
- Use pencil and paper to add and subtract big numbers, e.g. $5792 + 8436$, $13\ 912 - 5829$
- Know by heart all multiplication tables up to 10×10
- Double numbers up to 100 in their heads
- Use pencil and paper to multiply and divide, e.g. 328×4 , 72×56 , $329 \div 6$
- Draw and measure lines to the nearest millimetre
- Work out the perimeter and area of a rectangle, e.g. the perimeter and area of a book measuring 25cm by 20 cm
- Solve word problems and explain their method.

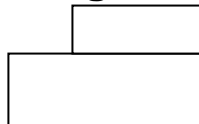


Maths Targets

Year 6

By the end of Year 6, most children should be able to...

- Know all tables to 10 x 10, especially for division, e.g. $63 \div 7 = 9$, and quickly work out the remainders
- Multiply and divide decimals by 10 or 100 in their heads, e.g. 2.61×10 ,
- $53.2 \div 100$
- Put numbers, including decimals, in order of size, e.g. 1.06, 0.099, 0.25, 1.67
- Use pencil and paper to add and subtract decimals, e.g. $3.91 + 8.04 + 24.56$, or $13.3 - 1.27$
- Use pencil and paper to multiply and divide, e.g. 387×46 , 21.5×7 , $539 \div 13$, $307.6 \div 4$
- Cancel fractions e.g. reduce $\frac{4}{20}$ to $\frac{1}{5}$, and work out which of two fractions is bigger, e.g. $\frac{7}{12}$ or $\frac{2}{3}$
- Work out simple percentages of whole numbers, e.g. 25% of £90 is £22.50
- Estimate angles and use a protractor to measure them
- Work out the perimeter and area of simple shapes that can be split into rectangles, e.g.



- Solve word problems and explain their methods
- Use co-ordinates to plot the position of points
- Understand and use information in graphs, charts and tables



HOW YOU CAN HELP

Independent research shows parental involvement is integral to raising standards.

- Parents sharing the activity with the child is the key
- Just sending more homework has no real effect
- Some activities need to be shared/discussed with an adult/parent/carer
- Involvement of parents in their child's education has been proved to be a vital factor in a child's success
- Feedback home-school/school-home is a very important aspect in order to reinforce the partnership of parents and school
- Parents are not expected to teach pupils but share, talk and listen to their child
- Most important is for parents to TALK AND LISTEN to children about their work in mathematics.
- A lot of mathematics can be done using everyday situations and does not have to mean pencil and paper, e.g. when shopping, on a journey etc.

