



## Parent Mini Guide

The Three  
Schools

# Maths: Upper KS2

### Top tips on how to support your child at home.

1. Make it Fun!
2. Let children see how maths is used in everyday life.
3. Learning key facts. Eg. Tables or bonds. It is better to do a little bit each day rather than one or two very long sessions. This way the concepts being taught will become really embedded. We need the children to become fluent.
4. Try to help the children see links and build on what they already know.  
E.g  $2 + 8 = 10$  so  $0.2 + 0.8 = 1.0$
5. Use the correct maths vocabulary with them and encourage them to talk about what they are doing. Being able to reason about maths helps improve their understanding of number.
6. Support them with their homework but don't take over.
7. It might be tempting to show them how you did maths at school but it will probably just confuse them. Ensure you use the strategies used in school. See our website for details.
8. Provide them with everyday problems. Eg. It takes 25 minutes to get to the station. If my train is at 9: 10, when do I need to leave?
9. Do a mixture of mental, written and practical maths.
10. Allow children thinking time.
11. Encourage a growth mindset. It's okay to find maths hard sometimes because when we achieve we can get that feel good factor. We learn from our mistakes. Don't just praise correct answers. Praise effort and the process because they will fail sometimes. E.g. I really like the way you worked that out. If they complain something is hard say: Great that means your brain is working hard.

### Formal Written calculations.

Below you will see a variety of ways of working out different calculations. The examples are designed to explain how some of the different written methods of calculating are being taught in school. This is important because these methods may be different to those you are familiar with.

### Addition.

Expanded Column method. ( Partitioning out) Used for TU + TU.

$$\begin{array}{r} 23 + 24 = 20 + 3 \\ \quad + 20 + 4 \\ \quad \quad \underline{40 + 7 = 47} \end{array}$$

Step 1. We partition each number out into tens and ones. It is important they line up correctly.

Step 2. We add the ones.

Step 3. We add the tens

Step 4. You add the tens and the ones together.

Expanded Column method. ( Vertically ) Used for TU + TU or HTU+ TU or decimals

$$\begin{array}{r} 23 + 24 = 123 \\ \quad + 24 \\ \quad \quad 7 \\ \quad \quad 40 \\ \quad \quad \underline{100} \\ \quad \underline{147} \end{array}$$

Step 1. Make sure the digits in the numbers line up correctly.

Step 2. We add the ones. ( 3 + 4 )

Step 3. We add the tens. ( 20 + 20 )

Step 4. We add the hundreds. ( 100 + 0 = 100 )

Step 4. Now we add the hundreds, tens and ones together.

Column Method Used for TU + TU upwards. Also for adding decimals.

$$587 + 135 =$$

$$\begin{array}{r} 587 \\ +135 \\ \underline{722} \\ 11 \end{array}$$

Step 1. Add the ones.  $7 + 5 = 12$ . The 2 goes in the ones column and the 1 goes under the tens column.

Step 2. Add the tens.  $80 + 30 = 110$ . You now add the 10 from underneath.  $110 + 10 = 120$ . The 1 digit that goes under the hundreds column. The 2 digit goes in the tens column.

Step 3. Add the hundreds.  $500 + 100 = 600$ . You also need to add on the 100 from underneath.  $600 + 100 = 700$ . So the 7 digit goes in the hundreds column.

To do the above quickly and accurately children need to be able to:  
Understand place value, know all bonds within 20, add multiples of ten and hundred depending on the size of the numbers.

**Subtraction.**

Expanded Column method. ( Partitioning out) Used for TU + TU. No exchanging/regrouping required.

$$\begin{array}{r} 48 + 24 = \quad 40 + 8 \\ \quad \quad \quad \underline{-20 + 4} \\ \quad \quad \quad 20 + 4 = 24 \end{array}$$

Step 1. We partition each number out into tens and ones. It is important they line up correctly.

Step 2. We take away the ones.

Step 3. We take away the tens

Step 4. You add the tens and the ones together.

Expanded Column method. ( Partitioning out) Used for TU + TU. Exchanging/regrouping is required.

$$\begin{array}{r} \quad \quad 30 \quad 12 \\ 48 + 24 = \quad \underline{40 + 2} \\ \quad \quad \quad \underline{-20 + 4} \\ \quad \quad \quad 20 + 4 = 24 \end{array}$$

Step 1. We partition each number out into tens and ones. It is important they line up correctly.

Step 2. We can not take 4 away from 2 so we exchange 1 ten for 10 units.

The tens column becomes ten less and the units become 10 more.

Step 3. We now take away the ones. ( 12- 4 )

Step 4. Next we take away the tens. ( 30-20)

Step 5. You now add the tens and the ones together.

Column Method Used for TU - TU upwards. No exchanging or regrouping.

$$587 - 135 =$$

$$\begin{array}{r} 587 \\ \underline{-135} \\ 452 \end{array}$$

Step 1. Take away the ones. ( 7-5= 2 ones )

Step 2. Take away the tens. ( 80-30= 5 tens)

Step 3. Take away the hundreds.( 500-100= 4 hundreds)

Column Method Used for TU - TU upwards. Also for taking away decimals.

$$538 - 156 =$$

4 13

$$\begin{array}{r} \cancel{5}38 \\ -156 \\ \hline 382 \end{array}$$

Step 1. Take away the ones (  $8-6=2$  ones )

Step 2. Take away the tens. We can't take 50 from 30 so we need to use exchanging/regrouping. We exchange 1 hundred for 10 tens. ( $130-50=8$ tens)

Step 3. Takeaway the hundreds. ( $400-100=3$  hundred

To do the above quickly and accurately children need to be able to:

Understand place value, know all bonds within 20, subtract multiples of ten and hundred etc depending on the size of the numbers.

## Multiplication

### Grid Method.

$32 \times 4 =$

x	30	2	
4	120	8	= 128

Step 1. Draw the grid.

Step 2. Partition the TU numbers out.

Step 3. Multiply the multiple of ten first. (  $4 \times 30 = 120$  )

Step 4. Multiply the ones. (  $4 \times 2 = 8$  )

Step 5. Add the two answers together. (  $120 + 8 = 128$  )

This method can also be used for decimals.

$36.2 \times 8 =$

x	30	6	0.2	
8	240	48	1.6	= 289.6

Step 1. Draw the grid.

Step 2. Partition the TU decimal out.

Step 3. Multiply the multiple of ten first. (  $8 \times 30 = 240$  )

Step 4. Multiply the ones. (  $8 \times 6 = 48$  )

Step 5. Multiply the tenth. (  $8 \times 0.2 = 1.6$  )

Step 6. Add the answers together. (  $240 + 48 + 1.6 = 289.6$  )

### Short Multiplication.( Expanded )

Another way of setting out multiplication is as a vertical calculation.

$$\begin{array}{r} 23 \\ \times 7 \\ 3 \times 7 \quad 21 \\ 20 \times 7 \quad \underline{140} \\ \underline{161} \end{array}$$

Step 1. Multiply the units

Step 2. Multiply the tens

Step 3. Add the two amounts together.

$$\begin{array}{r} 72 \\ \times 38 \\ 8 \times 2 \quad 16 \\ 8 \times 70 \quad 560 \\ 30 \times 2 \quad 60 \\ 30 \times 70 \quad \underline{2100} \\ \underline{2736} \end{array}$$

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### Short Multiplication.

$$\begin{array}{r} 23 \\ \times 7 \\ \underline{161} \\ 2 \end{array}$$

Step 1. Multiply the units (  $7 \times 3 = 21$  ) The 1 goes in the ones column and the 2 goes underneath in the tens column.

Step 2. Multiply the tens (  $7 \times 20 = 140 + 20$  underneath = 160/ 16 tens)

$$\begin{array}{r} 72 \\ \times 38 \\ 576 \text{ ( } 8 \times 72 \text{ )} \\ \underline{2160} \text{ ( } 30 \times 72 \text{ )} \\ \underline{2736} \end{array}$$

## Division

### Short division (Expanded method)

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

Step 1. Understand division as taking away ‘chunks’ at a time .

Step 2. Begin by establishing known possible ‘chunks’ by recalling multiplication facts for that number. (5x tables.)

Step 3. Take away the chunk. (  $10 \times 5 = 50$  )

Step 4. Continue removing chunks until you can no longer do so. (  $4 \times 5 = 20$  )

Step 5. Any number left will be a remainder ( 2 )

Step 6 Add up the chunks you have taken. (  $10 + 4$  )

The size of the chunks the children takeaway depend on their knowledge of their x tables.

### Short division

This is sometimes known as the bus shelter method, which you may well be familiar with. This method is used when we divide by units e.g.  $TU \div U$  and  $HTU \div U$

$$243 \div 7 =$$

$$\begin{array}{r} \underline{0 \ 3 \ 4 \ \text{r}5} \\ 7 \overline{) 2 \ 4 \ 3} \end{array}$$

$$243 \div 7 = 34 \text{ r}5$$

Long division. ( Expanded method )

This method is used when we divide by TU's.

$$\begin{array}{r} \underline{27} \\ 36) 972 \\ \underline{720} \\ 252 \quad \mathbf{20} \times 36 (10 \times 36 = 360, \text{ double } 360 = 720) \\ \underline{180} \quad \mathbf{5} \times 36 (10 \times 36 = 360, \text{ halve } 360 = 180) \\ 72 \\ \underline{72} \quad \mathbf{2} \times 36 \\ 0 \end{array}$$

Step 1. How many 15's in 4? 0

Step 2. How many 15's in 43? 2

Step 3.  $15 \times 2 = 30$  so we take this away from 43.

Step 4. 13 is left over. We then slide down the 2 to make 132.

Step 5. How many 15's in 132? 8

Step 6.  $15 \times 8 = 120$  so we take this away from 132.

Step 7. 12 is left over. We then slide down the 0 to make 120.

Step 8. How many 15's in 120? 8

Long division. (Sliding Method)

$$\begin{array}{r} 28.8 \\ 15) \underline{432.0} \\ \underline{30} \quad \downarrow \\ 132 \quad \downarrow \\ \underline{120} \quad \downarrow \\ 120 \\ \underline{120} \\ 0 \end{array}$$

## End of Year Expectations for Year 5 for New National Curriculum – EXPECTED (At National Standard)

Year 5 Maths	
Year 5 Number and Place Value	
<p><b>Number and Place Value</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit (count forwards or backwards in steps of powers of 10 for any given up to 1,000,000)</li> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.</li> <li>Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000</li> <li>Solve number problems and practical problems that involve all of the above.</li> <li>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> </ul>	<p><b>Addition and Subtraction</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar and subtraction).</li> <li>Add and subtract numbers mentally with increasing large numbers.</li> <li>Use <math>1000</math> as a unit to calculate and determine, in the context of a problem, levels of accuracy.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>
<p><b>Multiplication and Place Value</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Identify multiples and factors, including finding all factor pairs of a number, and know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</li> <li>Establish whether a number up to 100 is prime &amp; recall prime numbers up to 19.</li> <li>Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.</li> <li>Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.</li> <li>Multiply and divide whole numbers and those involving decimals by 10, 100 &amp; 1000.</li> <li>Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3).</li> <li>Solve problems involving multiplication and division including using their knowledge of units and multiples, squares and cubes.</li> <li>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.</li> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</li> </ul>	<p><b>Fractions</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Compare and order fractions whose denominators are all multiples of the same number.</li> <li>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other (e.g. the mathematical statements <math>2 &gt; 1</math> as a mixed number <math>1\frac{1}{2} &gt; 1</math>).</li> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number.</li> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</li> <li>Read and write decimal numbers as fractions (for example, <math>0.71 = \frac{71}{100}</math>), recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place.</li> <li>Read, write, order &amp; compare numbers with up to three decimal places.</li> <li>Solve problems involving number up to three decimal places.</li> <li>Recognise the percent symbol (%) and understand that percent relates to 'number of parts per hundred', write percentages as a fraction with denominator 100, &amp; as a decimal.</li> <li>Solve problems which require knowing percent &amp; decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math> and those fractions with a denominator of a multiple of 10 or 25.</li> </ul>

Year 5 Geometry and Measures	
<p><b>Measures</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre &amp; millilitre).</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.</li> <li>Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.</li> <li>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes.</li> <li>Estimate volume (for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)) and capacity (for example, using water).</li> <li>Solve problems involving converting between units of time.</li> <li>Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling.</li> </ul>	<p><b>Geometry – Properties of Shapes</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> <li>Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles.</li> <li>Draw given angles, and measure them in degrees (°).</li> <li>Identify angles at a point and one whole turn (total 360°) angles at a point on a straight line &amp; <math>1/2</math> &amp; <math>1/4</math> turn (total 180°) and other multiples of 90°.</li> <li>Use the properties of rectangles to deduce related facts and find missing lengths and angles distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> </ul>
<p><b>Statistics</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Solve comparison, sum and difference problems using information presented in a line graph.</li> <li>Complete, read and interpret information in tables, including timetables.</li> </ul>	<p><b>Geometry – Position and Movement</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</li> </ul>

## End of Year Expectations for Year 6 for New National Curriculum – EXPECTED (At National Standard)

Year 6 Maths	
Year 6 Number and Place Value	
<p><b>Number and Place Value</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.</li> <li>Round any whole number to a required degree of accuracy.</li> <li>Use negative numbers in context, and calculate intervals across zero.</li> <li>Solve number and practical problems that involve all of the above.</li> </ul>	<p><b>Addition, Subtraction, Multiplication and Division</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.</li> <li>Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.</li> <li>Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.</li> <li>Perform mental calculations, including with mixed operations and large numbers.</li> <li>Identify common factors, common multiples and prime numbers.</li> <li>Use their knowledge of the order of operations to carry out calculations involving the four operations.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>
<p><b>Fractions</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Use common factors to simplify fractions; use common multiples to express fractions in the same denominator.</li> <li>Compare and order fractions, including fractions <math>&gt; 1</math>.</li> <li>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> <li>Multiply simple pairs of proper fractions, writing the answer in its simplest form. (for example, <math>\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}</math>).</li> <li>Divide proper fractions by whole numbers. <math>\frac{1}{2} \div 2 = \frac{1}{6}</math></li> <li>Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (e.g. <math>\frac{3}{8}</math>).</li> <li>Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places by whole numbers.</li> <li>Use written division methods in cases where the answer has up to two decimal places.</li> <li>Solve problems which require answers to be rounded to specified degrees of accuracy.</li> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> </ul>	<p><b>Ratio and Proportion</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</li> <li>Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison.</li> <li>Solve problems involving similar shapes where the scale factor is known or can be found.</li> <li>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</li> </ul>
<p><b>Algebra</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Use simple formulae.</li> <li>Generate and describe linear number sequences.</li> <li>Express missing number problems algebraically.</li> <li>Find pairs of numbers that satisfy an equation with two unknowns.</li> <li>Enumerate possibilities of combinations of two variables.</li> </ul>	<p><b>Statistics</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Describe positions on the full coordinate grid (all four quadrants).</li> <li>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</li> </ul>

Year 6 Geometry and Measures	
<p><b>Measures</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</li> <li>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places.</li> <li>Convert between miles and kilometres.</li> <li>Recognise that shapes with the same areas can have different perimeters and vice versa.</li> <li>Recognise when it is possible to use formulae for area and volume of shapes.</li> <li>Calculate the area of parallelograms and triangles.</li> <li>Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm<sup>3</sup>) and cubic metres (m<sup>3</sup>), and extending to other units (for example, mm<sup>3</sup> and km<sup>3</sup>).</li> </ul>	<p><b>Geometry – Properties of Shapes</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Draw 2-D shapes using given dimensions and angles.</li> <li>Recognise, describe and build simple 3-D shapes, including making nets.</li> <li>Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.</li> <li>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</li> </ul>
<p><b>Geometry – Position and Movement</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Describe positions on the full coordinate grid (all four quadrants).</li> <li>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</li> </ul>	<p><b>Statistics</b></p> <p>Sufficient evidence shows the ability to:</p> <ul style="list-style-type: none"> <li>Interpret and construct pie charts and line graphs and use these to solve problems.</li> <li>Calculate and interpret the mean as an average.</li> </ul>