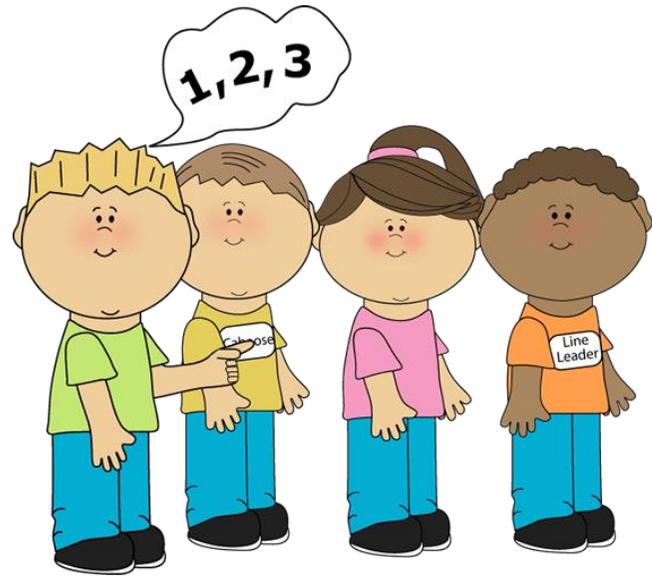


Maths: Lower KS2



Parent Mini
Guides

The Three Schools



Top tips on how to support your child at home.

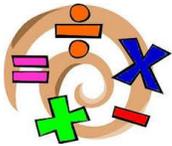
1. Make it Fun!
2. Let children see how maths is used in everyday life.
3. Learning key facts. Eg. Tables or bonds. It is better to do a little bit each day rather than one or two very long sessions. This way the concepts being taught will become really embedded. We need the children to become fluent.
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.



Here are just a few suggestions:

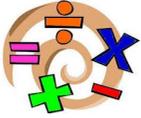
Counting.

- Count forwards and back as you walk up and down the stairs. Look at the mental calculations policy to find out what tables they should learn and what steps they need to count in. Eg Year 3. Count in 8's or 50's. Year 4. Count in $1/100^{\text{th}}$ s.

Addition and Subtraction.

- Use dice to create random two or three digit numbers and get the children to add or subtract them.
- Play Ping Pong to learn bonds. E.g. Bonds to 100. You say Ping, they say Pong and then you might say 70 and they would say 30 etc. You can also do this for 60. You say 37, they would say 23. (You want the children to answer instantly and to use previous knowledge of bonds to do this. $37 + 3 = 40 + 20 = 60$)
- Catching and Throwing. Throw a ball and call out a calculation, the children catch the ball and give their answer. E.g. Adding a near multiple of ten. $134 + 29 = 134 + 30 = 164 - 1 = 163$.
- Splat. Have a large piece of paper and write a range of fractions on the paper. Unit fractions (E.g $1/3$) and non unit (E.g $2/5$). You call out a fraction and the children would need to find the other fraction that would make a whole. Eg. You call out $3/5$ so the child would cover up $2/5$ as this would make $5/5$ which is a whole. You can play this with three people, one person calls out the numbers and the other two race to see who can find the answer quickest. This can be used for lots of things such as bonds and x tables.

- Get the children to solve real life problems. E.g Helping you work out how many fence panels to buy or calculating the cost of the flights for the annual holiday.
- Phrase questions in lots of different ways using a range of vocabulary. Eg. Multiple/factor etc.
- The game of darts is really great for developing mental maths.
- Beat the calculator. Can they add or subtract the numbers before you get the answer up on the calculator?
- Give your child a number. Ask the child to write as many number calculations as they can.
Eg 0.6 . $1 - 0.4 = 0.6$ $2 \times 0.6 = 1.2$
(Get them to see patterns and encourage them to work methodically.)
- Add this take that. A good one to do around the dinner table. Decide on the starting number and what you are going to add then take away as you take turns. E.g Start at 5. We are going to add 0.5 and then take away 0.25. You can do this until you reach a target number or until you can't go on anymore!



Multiplication and division.

- Use CD's or you tube to find musical x tables they can sing along to.
- Learn tables out of sequence and related division facts. Rapid recall. Can they do it without using their fingers!
- Give the children real life problems to encourage application of times tables.
- Adapt the games like Ping Pong, Splat, Catching and throwing game mentioned above.
- Darts again. Child has to x the number they land on by whatever x table they are practising.
- Play bingo. Make a grid and children fill it with multiples of 6. You then call out x sums or \div sums and they cross out the answers.

Money.

- Encourage children to have their own purses and money boxes. Give them the opportunity to pay for things at the local shop and check their change.

Measure

- Give children the opportunity to cook. Reading scales is really useful and being able to convert one unit of measure to another.
- Provide your child with a ruler or tape measure so the can see the different units of measure.
- Set them a mission. Can they find something in the house which is exactly 10cm? Can they find 3 things that would measure exactly 1m when lined up?
- Look in the kitchen cupboards and look at all the different units of measure you can find.
- Invest in an analogue clock as well as a digital one. So children become fluent, constantly ask them what the time it is at different times of the day. Ask questions like how long is it until this program finishes etc.
- Get children to watch the weather forecast so they get to understand temperature.

Computers/Internet:

- Mymaths- www.mymaths.co.uk Username-swanbournece Password- infinite1.
You can either do the lessons or the homework. It is good for x tables practise as you can select the one you want to practise. You go to number and then multiplication and division.
- Nrich website for problem solving.
- Timestables me- produce x tables and \div worksheets.
- Snappy maths

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.

$$587 + 135 =$$

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

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.

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

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.

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

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

5

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) 10

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

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

$$587 - 135 =$$

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

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.

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

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)

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

Division

Short division (Expanded method)

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

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 take away 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 3 expectations

Place value	Addition and Subtraction	Multiplication and division	Fractions
<ul style="list-style-type: none"> Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. Recognise the place value of each digit in a four-digit number (hundreds, tens, ones). Compare and order numbers up to 1000. Identify, represent and estimate numbers using different representations. Read and write numbers up to 1000 in numerals and in words. Solve number problems and practical problems involving these ideas. 	<ul style="list-style-type: none"> Add and subtract numbers mentally, including a three-digit number and tens, a three-digit number and hundreds. Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction. Estimate the answer to a calculation and use inverse operations to check answers. Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. 	<ul style="list-style-type: none"> Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers ones, one-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in word problems are connected to objects. 	<ul style="list-style-type: none"> Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. Recognise and show, using diagrams, equivalent fractions with small denominator. Add and subtract fractions with the same denominator, within one whole (for example, $5/7 + 1/7 = 6/7$). Compare and order unit fractions, and fractions with the same denominators. Solve problems that involve all of the above.
Measures	Geometry - Properties of Shape.	Geometry - Position and Movement	Statistics.
<ul style="list-style-type: none"> Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). Measure the perimeter of simple 2-D shapes. Add and subtract amounts of money to give change, using both £ and p in practical contexts. Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year. Compare durations of events (for example to calculate the time taken by particular events or task) 	<ul style="list-style-type: none"> Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. Recognise angles as a property of shape or a description of a turn. Identify right angles; recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	<ul style="list-style-type: none"> Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). 	<ul style="list-style-type: none"> Interpret and present data using bar charts, pictograms and tables solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?'). Use information presented in scaled bar charts and pictograms and tables.

End of Year 4 expectations

Place value	Addition and Subtraction	Multiplication and division	Fractions
<ul style="list-style-type: none"> Count in multiples of 6, 7, 9, 25 and 1000 Find 1000 more or less than a given number. Count backwards through zero to include negative numbers. Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones). Order and compare numbers beyond 1000. Identify, represent and estimate numbers using different representations. Round any number to the nearest 10, 100 or 1000. 6 Solve number and practical problems that involve all of the above and with increasingly large positive numbers. Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. 	<ul style="list-style-type: none"> Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. Estimate and use inverse operations to check answers to a calculation. Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. 	<ul style="list-style-type: none"> Recall multiplication and division facts for multiplication tables up to 12×12. Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. Recognise and use factor pairs and commutativity in mental calculations. Multiply two-digit and three-digit numbers by a one digit number using formal written layout. Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. 	<ul style="list-style-type: none"> Recognise and show, using diagrams, families of common equivalent fractions Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities. Use information presented in scaled bar charts and pictograms, tables and the same answer is a whole number. Add and subtract fractions with the same denominator. Recognise and write decimal equivalents of any number of tenths or hundredths. Recognise and write decimal equivalents to $1/4$, $1/2$, $3/4$. Find the effect of dividing a one- or two-digit number by 10 and 100; identifying the value of the digits in the answer as ones, tenths and hundredths. Round decimals with one decimal place to the nearest whole number. Compare numbers with the same number of decimal places up to two decimal places. Solve simple measure and money problems involving fractions and decimals to two decimal places.
Measures	Geometry - Properties of Shape.	Geometry - Partition and Movement	Statistics.
<ul style="list-style-type: none"> Convert between different units of measure (for example, kilometre to metre; hour to minute). Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Find the area of rectilinear shapes by counting squares. 6 Estimate, compare and calculate different measures, including money in pounds and pence. Read, write and convert time between analogue and digital 12- and 24-hour clocks. Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. 	<ul style="list-style-type: none"> Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify acute and obtuse angles and compare and order angles up to two right-angles by size. Identify lines of symmetry in 2-D shapes presented in different orientations. Complete a simple symmetric figure with respect to a specific line of symmetry. 	<ul style="list-style-type: none"> Describe positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down. Plot specified points and draw sides to complete a given polygon. 	<ul style="list-style-type: none"> Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.