A Parent's Guide to Mathematics

This booklet has been written to help you understand how mathematics is taught throughout our school. It is **not** intended as a list to work through and each stage should only be attempted when your child is ready. It also gives practical ideas, suggestions and vocabulary for helping at home.

We know that parents are keen to help with their child's education but may find they do not understand what their child is doing as it is different to the way they were taught or find they confuse their children with their methods.

The days are gone when maths lessons are endless pages of calculations to be done in silence. Today it is a lot more about collaboration and investigation. Children are taught why the methods work, not just how to perform them. It is the difference between telling someone directions and giving them a map.

So use this guide to help you and your child gain in confidence and remember to make maths fun!

Mastery in Mathematics

At Whitestone we believe all children have the capability to become Masters at Maths. This thinking is called a 'growth mindset.' It allows children that they have an unlimited maths potential and that being good at maths is all about working hard and not about being 'smart.' We praise their effort and their thinking rather than their achievement e.g. "Well done for your thinking."
Below are the 7 principles of this growth mindset:

1. Everyone can learn maths to the highest level.
2. Mistakes are valuable.
3. Questions are really useful.
4. Maths is about creativity and making sense.
5. Maths is about connections and communicating.
6. Maths is about learning not performing.
7. Depth is more important than speed.

With this in mind we encourage our children to develop a greater depth of understanding rather than just working on the next topic. It is important for children to really grasp how to perform a procedure in many different ways and contexts rather than just working with greater numbers. So before exploring numbers to 100, consider the following with numbers to 10:

$3 + 2 = \square$	$\square = 6 + 2$	$3 + \square = 4$	$\square + \square = 8$	$4 + 3 = 6 + \square$
$9 - 3 = \square$	$6 - \square = 2$	$5 = \square - 2$	$\square - \square = 7$	$5 - \square = 8 - \square$

Children will also be asked to use these procedures in word problems, with money and measurement before using greater numbers since it is just the same procedures and no more challenging.

Some Do's and Don'ts

- ✓ Do make maths silly, gruesome or scary — get your child excited about maths questions e.g. I bet you don't know the answer?
- ✓ Do recognise there's more than one way of doing calculations — children's methods may be long winded or confusing, but you should always let them try their own way of solving a problem. Notice one method does not solve all calculations e.g. you would use different methods to find 378+499 to 378 + 468.
- ✓ Don't expect children to 'get it' after you've explained once — it can take a long time for the penny to drop. It is perfectly normal for children not to recognise a concept in a new context.
- ✓ Don't tell your child you are hopeless at maths — many adults claim that are not good at maths and this can give the message that maths is difficult, not enjoyable and ultimately not important to succeed in life. This just isn't true, as adults we deal with mathematics everyday and cope with it. Just because you don't remember how to complete long division, doesn't mean you don't understand mathematics.
- ✓ Do encourage your child to be resilient and have a go at challenging themselves to build their learning power.
- ✓ When a child gets a question wrong, it is tempting to tell them they are wrong and how to correct it. Instead ask them to explain their method and help them spot their mistake.
- ✓ Similarly if a child gets a question right, do get them to explain how they reached their answer; perhaps pretending not to understand.
- ✓ Do play maths with your child — board games or cards are full of maths and are an ideal way to engage mathematical thinking.
- ✓ Do let your child win, or be 'better than you' - of course you know your child best, so will know the correct balance of winning and losing, but you can compete against one another within a mathematical context e.g. I bet you can't get ready for bed in 5 minutes.
- ✓ Do make maths a casual part of what you do while you're doing something else — instead of making maths formal, find ways to sneak it in e.g. How many more plates do I need? Have we got enough money for the bread and milk? Did you see the number 23 bus?

Maths props to have in your house

- ❖ Tape measure and ruler - get your child involved when completing DIY.
- ❖ Bar of chocolate (with squares) - good for showing multiplication and fractions.
- ❖ Magnet numbers - a great way for impromptu maths in the house.
- ❖ Dartboard - darts teaches not only addition, subtraction and multiplication but also raises discussions of what is needed to finish the game.
- ❖ Unusual dice - they don't have to be 6 sided.
- ❖ Dominoes - another great game to show combinations of numbers
- ❖ Guess who - this game shows how to group characters into categories and can be extended to shapes and numbers.
- ❖ Thermometer - shows both positive and negative numbers to discuss.
- ❖ A prominent clock - try using both an analogue and digital clock. Can you compare the two?
- ❖ A wall calendar - not only good for noticing days and months, but also for finding patterns.
- ❖ Board games with dice or spinner - why not make your own board game?
- ❖ Pack of playing cards - not only can you learn about counting but also chance and probability.
- ❖ Calculator - you can discover so many patterns with calculators, not just basic computation.
- ❖ Measuring jug - discover both imperial and metric ways of measuring.
- ❖ Scales - traditional balances can show counting as well as measuring.
- ❖ Dried beans, pasta - useful for counting, dividing and finding the difference.

Keep an eye out for the 'maths sacks' which will be sent home with lots more maths ideas and games

Learning Intentions by the end of the year

By the end of Reception <u>all children should</u> be able to complete the following in number:

- Recognise some numerals of personal significance.
- Recognise numeral 1-5.
- Counts up to three or four objects by saying one number name for each item.
- Counts actions or objects which cannot be moved.
- Counts objects up to 10, and beginning to count beyond 10.
- Counts out up to six objects from a larger group.
- Selects the correct numeral to represent 1 to 5, then 1 to 10 objects.
- Counts an irregular arrangement of up to ten objects.
- Estimates how many objects they can see and checks by counting them.
- Uses the language of 'more' and 'fewer' to compare two sets of objects.
- Find the total number of items in two groups by counting all of them.
- Says the number that is one more than a given number.
- Finds one more or one less from a group of up to five objects, then ten objects.
- In practical activities & discussion, beginning to use the vocabulary involved in adding & subtracting.
- Records, using marks that they can interpret and explain.
- Begins to identify own mathematical problems based on own interests and fascinations.

By the end of Reception <u>some children should</u> be able to complete the following in number:

Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

By the end of Reception <u>all children should</u> be able to complete the following in Shape, Space and Measure:

- Beginning to use mathematical names for solid 3D shapes and flat 2D shapes, and mathematical terms to describe shapes.
- Selects a particular named shape.
- Can describe their relative position such as 'behind' or 'next to.'
- Orders two or three items by length or height.
- Orders two items by weight or capacity.
- Uses familiar objects and common shapes to create and recreate patterns and build models.
- Uses everyday language related to time.
- Beginning to use everyday language related to money.
- Orders and sequences familiar events.
- Measures short periods of time in simple ways.

By the end of Reception <u>some children should</u> be able to complete the following in Shape, Space and Measure:

Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

By the end of the Year One most children should be able to complete the following:

Number and place value
- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- count, read and write numbers to 100 in numerals, count in different multiples including ones, twos, fives and tens
- given a number, identify one more and one less
- identify and represent numbers using concrete objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- read and write numbers from 1 to 20 in digits and words.

Addition and subtraction
- read, write & interpret mathematical statements involving addition (+) subtraction (-) & equals (=)
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero
- solve simple one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.

Multiplication and division
- solve simple one-step problems involving multiplication and division, calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Fractions
- recognise, find and name a half as one of two equal parts of an object, shape or quantity
- recognise, find and name a quarter as one of four equal parts of an   object, shape or quantity

Measures
Compare, describe and solve practical problems for:
- lengths and heights (e.g. long/short, longer/shorter, tall/short)
- mass or weight (e.g. heavy/light, heavier than, lighter than)
- capacity/volume (full/empty, more than, less than, quarter)
- time (quicker, slower, earlier, later)

Measure and begin to record the following:
- lengths and heights
- mass/weight
- capacity and volume
- time (hours, minutes, seconds)
- recognise and know the value of different denominations of coins and notes
- sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening
- recognise and use language relating to dates, including days of the week, weeks, months and years
- tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

Geometry: properties of shapes
- recognise and name common 2-D and 3-D shapes, including:
- 2-D shapes (e.g. rectangles (including squares), circles and triangles)
- 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres).

Geometry: position, direction, motion
- order and arrange combinations of objects and shapes in patterns
- describe position, directions and movements, including half, quarter and three-quarter turns.

By the end of the Year Two most children should be able to complete:
(Highlighted statements refer to the Teacher Assessment Focuses)

Number and place value
- count in steps of 2, 3, and 5 from 0, and count in tens from any number, forward or backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use <, > and = signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems.

Addition and subtraction
- solve simple one-step problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit number and ones; a 2-digit number and tens; two 2-digit numbers; adding three 1-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.

Multiplication and division
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- recognise and use the inverse relationship between multiplication and division in calculations
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve one-step problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Fractions
- recognise, find, name & write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity
- write simple fractions e.g. 1/2 of 6 = 3 and recognise the equivalence of two quarters and one half.

Measures
- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using >, < and =
- read relevant scales to the nearest numbered unit
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value and match different combinations of coins to equal the same amounts of money; add and subtract money of the same unit, including giving change
- solve simple problems in a practical context involving addition and subtraction of money
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.

Geometry: properties of shapes
- identify & describe properties of 2-D shapes, including the number of sides & symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- identify 2-D shapes on the surface of 3-D shapes, e.g. a circle on a cylinder and a triangle on a pyramid
- compare and sort common 2-D and 3-D shapes and everyday objects.

Geometry: position, direction, motion
- order and arrange combinations of mathematical objects in patterns
- use mathematical vocabulary to describe position, direction and movement, including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise), and movement in a straight line.

Data
- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and compare categorical data.

Vocabulary used by the end of Year Reception

Number
zero, number, one, two, three...to twenty and beyond, teens numbers, none, how many, count, count (up) to, count on (from, to), count back (from, to), count in ones, twos, fives, tens, is the same as, more, less, odd, even, few, pattern, pair

Place value
ones, tens, digit, the same number as, as many as, more, larger, bigger, greater fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third… twentieth, last, last but one, before, after, next, between

Estimating
guess, how many, estimate, nearly, close to, about the same as, just over, just under, too many, too few, enough, not enough

Multiplication and division
sharing, doubling, halving, number patterns

Fractions
parts of a whole, half, quarter

Addition and subtraction
add, more, and, make, sum, total, altogether, double, one more, two more … ten more, how many more to make …? how many more is … than …? how much more is …? take away, how many are left/left over? how many have gone? one less, two less, ten less … how many fewer is … than …? how much less is …? difference between

Measurement
measure, size, compare, guess, estimate, enough, not enough, too much, too little, too many, too few, nearly, close to, about the same as, just over, just under

Length
metre, length, height, width, depth, long, short, tall, high, low, wide, narrow, thick, thin, longer, shorter, taller, higher … and so on, longest, shortest, tallest, highest … and so on, far, near, close

Weight
weigh, weighs, balances, heavy, light, heavier than, lighter than, heaviest, lightest, scales

Capacity & volume
full, empty, half full, holds, container

Time
time, days of the week, Monday, Tuesday … day, week, birthday, holiday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, quickly, slow, slower, slowest, slowly, old, older, oldest, new, newer, newest, takes longer, takes less time, hour, o'clock, clock, watch, hands

Money
money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay

Properties of shape
shape, pattern, flat, curved, straight, round, hollow, solid, sort, make, build, draw, size, bigger, larger, smaller, symmetrical, pattern, repeating pattern, match

2-D shape
corner, side, rectangle (including square), circle, triangle

3-D shape
face, edge, vertex, vertices, cube, sphere, pyramid, cone

Position & direction
position, over, under, above, below, top, bottom, side on, in, outside, inside, around, in front, behind, front, back, beside, next to, opposite, apart, between, middle, edge, corner, direction, left, right, up, down, forwards, backwards, sideways, across, next to, close, near, far, along, through, to, from, towards, away from, movement, slide, roll, turn, stretch, bend, whole turn, half turn

Statistics
count, sort, group, set, list

General
pattern, puzzle, what could we try next? how did you work it out? recognise, describe, draw, compare, sort

Vocabulary used by the end of the Year 1

Number
zero, number, one, two, three...to twenty and beyond, teen numbers, none, how many, count, count (up) to, count on (from, to), count back (from, to), count in ones, twos, fives, tens, is the same as, more, less, odd, even, few, pattern, pair, numeral, twenty-one, twenty-two...one hundred, forwards, backwards, equal to, equivalent to, most, leas, many, multiple, of

Place value
ones, tens, digit, the same number as, as many as, more, larger, bigger, greater fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third… twentieth, last, last but one, before, after, next, between, equal to, half-way between, above, below

Addition and subtraction
add, more, and, make, sum, total, altogether, double, one more, two more … ten more, how many more to make? how many more is ? than ? how much more is? take away, how many are left/left over? how many have gone? one less, two less, ten less? how many fewer is … than? how much less is? difference between, addition, near double, half, halve, subtract, equals, is the same as, number bonds/pairs, missing number

Multiplication and division
sharing, doubling, halving, number patterns, multiplication, multiply, multiplied by, multiple, division, dividing, grouping, array

Fractions
parts of a whole, half, quarter, fraction, equal part, equal grouping, equal sharing, one of two equal parts, one of four equal parts

Estimating
guess, how many, estimate, nearly, close to, about the same as, just over, just under, too many, too few, enough, not enough, roughly

Money
money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change, dear, costs more, cheap, costs less, cheaper, costs the same as, how much? How many? Total

Properties of shape
shape, pattern, flat, curved, straight, round, hollow, solid, sort, size, make, build, draw, bigger, larger, smaller, symmetrical, pattern, repeating pattern, match, symmetry

2-D shape
corner, side, rectangle (including square), circle, triangle, point, pointed

3-D shape
face, edge, vertex, vertices, cube, sphere, pyramid, cone, cuboid, cylinder

Measurement
measure, size, guess, compare, estimate, enough, not enough, too much, too little, too many, too few, nearly, close to, about the same as, just over, just under, measurement, roughly

Length
metre, length, height, width, depth, long, tall, short, high, low, wide, narrow, thick, thin, longer, shorter, taller, higher … and so on, longest, shortest, tallest, highest, far, near, close, centimeter, ruler, metre stick

Weight
weigh, weighs, balances, heavy, light, heavier than, lighter than, heaviest, lightest, scales, kilogram, half kilogram

Capacity and volume
full, empty, half full, holds, container, litre, half litre, capacity, volume, more than, less than, quarter full

Position & direction
position, over, under, above, below, top, bottom, side on, in, outside, inside, around, in front, behind, front, back, beside, next to, opposite, apart, between, middle, edge, corner, direction, left, right, up, down, across, forwards, backwards, sideways, next to, near close, far, along, from, to, through, towards, away from, movement, slide, roll, turn, stretch, bend, whole turn, half turn, underneath, centre, journey, quarter turn, three-quarter turn

Time
time, days of the week, Monday, Tuesday … day, week, birthday, holiday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, quickly, slow, slower, slowest, slowly, old, older, oldest, new, newer, newest, takes longer, takes less time, hour, o'clock, clock, watch, hands, month of the year (January, February…) seasons: spring, summer, autumn, winter, weekend, month, year, earlier, later, first, midnight, date, how long ago? how long will it be to…? how long will it take to…? how often? always, never, often, sometimes, usually, once, twice, half past, quarter past, quarter to, clock face, hour hand, minute hand, hours, minutes

Statistics
count, sort, group, set, list, vote, table

General
pattern, puzzle, what could we try next? how did you work it out? recognise, describe, draw, compare, sort, problem, problem solving, mental, mentally, explain your thinking

Vocabulary used by the end of the Year 2

Number
zero, number, one, two, three...to twenty and beyond, teens numbers, none, how many, count, count (up) to, count on (from, to), count back (from, to), count in ones, twos, fives, tens, is the same as, more, less, odd, even, few, pattern, pair, numeral, twenty-one, twenty-two...one hundred, forwards, backwards, equal to, equivalent to, most, least, many, multiple, of, two hundred...one thousand, threes, fours… tally, sequence, continue, predict, rule, > greater than, < less than,

Place value
ones, tens, digit, the same number as, as many as, more, larger, bigger, greater fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third… twentieth, last, last but one, before, after, next, between, equal to, half-way between, above, below, hundreds, one-, two or three digit number place, place value, stands for, represents, exchange, twenty-first, twenty-second...

Estimating
guess, how many, estimate, nearly, close to, about the same as, just over, just under, too many, too few, enough, not enough, roughly, exact, exactly

Addition & subtraction
add, more, and, make, sum, total, altogether, double, one more, two more … ten more, how many more to make …? how many more is … than …? how much more is …? take away, how many are left/left over? how many have gone? one less, two less, ten less … how many fewer is … than …? how much less is …? difference between, addition, near double, half, halve, subtract, equals, is the same as, number bonds/pairs, missing number, one hundred more, one hundred less, number facts, tens boundary

Multiplication & division
sharing, doubling, halving, number patterns, multiplication, multiply, multiplied by, multiple, division, dividing, grouping, array, groups of, times, once, twice, three times...ten times, repeated addition, divide, divided by, divided into, share, share equally, left, left over, one each, two each, three each… each group in pairs, threes...tens, equal groups of, row, column, multiplication table, multiplication fact, division fact

Fractions
parts of a whole, half, quarter, fraction, equal part, equal grouping, equal sharing, one of two equal parts, one of four equal parts, equivalent fraction, mixed number, numerator, denominator, two halves, two quarters, three quarters, one third, two thirds, one of three equal parts

Money
money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change, dear, costs more, cheap, costs less, cheaper, costs the same as, how much…? How many…? total, bought, sold

Statistics
count, sort, group, set, list, vote, table, tally, graph, block graph, pictogram, represent, label, title, most popular, most common, least popular, least common

General
pattern, puzzle, what could we try next? how did you work it out? recognise, describe, draw, compare, sort, problem, problem solving, mental, mentally, explain your thinking, show how you… explain your method, describe the pattern, describe the rule, investigate, mental calculation, written calculation

Properties of shape
shape, pattern, flat, curved, straight, round, hollow, solid, sort, make, build, draw, size, bigger, larger, smaller, symmetrical, pattern, repeating pattern, match, symmetry, surface, line symmetry

2-D shape
corner, side, rectangle (including square), circle, triangle, point, pointed, rectangular, circular, triangular, pentagon, hexagon, octagon

3-D shape
face, edge, vertex, vertices, cube, pyramid, sphere, cone, cuboid, cylinder

Position and direction
position, over, under, above, below, top, bottom, side on, in, outside, inside, around, in front, behind, front, back, beside, next to, opposite, apart, between, middle, edge, corner, direction, left, right, up, down, forwards, backwards, sideways, across, next to, close, near, far, along, through, to, from, towards, away from, movement, slide, roll, turn, stretch, bend, whole turn, half turn, underneath, centre, journey, quarter turn, three-quarter turn, route, higher, lower, clockwise, anticlockwise, right angle, straight line

Measurement
measure, size, compare, guess, estimate, enough, not enough, too much, too little, too many, too few, nearly, close to, about the same as, just over, just under, measurement, roughly, measuring scale

Length
metre, length, height, width, depth, long, short, tall, high, low, wide, narrow, thick, thin, longer, shorter, taller, higher … and so on, longest, shortest, tallest, highest … and so on, far, near, close, centimeter, ruler, metre stick, further, furthest, tape measure

Weight
weigh, weighs, balances, heavy, light, heavier than, lighter than, heaviest, lightest, scales, kilogram, half kilogram, gram

Capacity and volume
full, empty, half full, holds, container, litre, half litre, capacity, volume, more than, less than, quarter full, millilitre, contains

Temperature
Temperature, degree

Time
time, days of the week, Monday, Tuesday … day, week, birthday, holiday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, quickly, slow, slower, slowest, slowly, old, older, oldest, new, newer, newest, takes longer, takes less time, hour, o'clock, clock, watch, hands, month of the year (January, February…) seasons: spring, summer, autumn, winter, weekend, month, year, earlier, later, first, midnight, date, how long ago? how long will it be to…? how long will it take to…? how often? always, never, often, sometimes, usually, once, twice, half past, quarter past, quarter to, clock face, hour hand, minute hand, hours, minutes, fortnight, 5,10,15...minutes past, digital, analogue clock, watch, timer, seconds

Known Facts

Number Bonds

Knowing the number bonds isn't just which numbers add together to make the number, but also the related subtraction facts. Below are all the number bond facts to 10 and 20. Once these are learnt & can be manipulated it will help your child complete more complicated calculations. It is important to note there are a lot of similarities & patterns to be found between the facts & these should be explored to further deepen understanding.

Number Facts to 10	Number Facts to 20		
0 + 10 = 10	0 + 20 = 20	10 + 10 = 20	
1 + 9 = 10	1 + 19 = 20	11 + 9 = 20	
2 + 8 = 10	2 + 18 = 20	12 + 8 = 20	
3 + 7 = 10			Try different ways of learning the number bond facts to become fluent e.g. Using objects, cards, dominoes etc. There are also some great websites and apps available. Try visiting the school's learning platform to find some suggestions.
4 + 6 = 10	3 + 17 = 20	13 + 7 = 20	
5 + 5 = 10	4 + 16 = 20	14 + 6 = 20	
6 + 4 = 10	5 + 15 = 20	15 + 5 = 20	
7 + 3 = 10	6 + 14 = 20	16 + 4 = 20	
8 + 2 = 10	7 + 13 = 20	17 + 3 = 20	
9 + 1 = 10	8 + 12 = 20	18 + 2 = 20	
10 + 0 = 10	9 + 11 = 20	19 + 1 = 20	
		20 + 0 = 20	
10 - 0 = 10			
10 - 1 = 9	20 - 0 = 20	20 - 10 = 10	
10 - 2 = 8	20 - 1 = 19	20 - 9 = 11	
10 - 3 = 7	20 - 2 = 18	20 - 8 = 12	
10 - 4 = 6	20 - 3 = 17	20 - 7 = 13	
10 - 5 = 5	20 - 4 = 16	20 - 6 = 14	
10 - 6 = 4	20 - 5 = 15	20 - 5 = 15	
10 - 7 = 3	20 - 6 = 14	20 - 4 = 16	
10 - 8 = 2	20 - 7 = 13	20 - 3 = 17	
10 - 9 = 1	20 - 8 = 12	20 - 2 = 18	
10 - 10 = 0	20 - 9 = 11	20 - 1 = 19	
		20 - 0 = 20	

Times Tables

Being able to count on and back in a set number is very useful. But knowing your times tables by rote can make all the difference when trying to multiply and divide. Below are examples of the 2, 3, 4, 5 & 10 times table as they are learnt in school. It is important to note the times table is shown first so children see which number to count up in.

2 Times Table	5 Times Table	10 Times Table
2 times by 1 is 2	5 times by 1 is 5	10 times by 1 is 10
2 times by 2 is 4	5 times by 2 is 10	10 times by 2 is 20
2 times by 3 is 6	5 times by 3 is 15	10 times by 3 is 30
2 times by 4 is 8	5 times by 4 is 20	10 times by 4 is 40
2 times by 5 is 10	5 times by 5 is 25	10 times by 5 is 50
2 times by 6 is 12	5 times by 6 is 30	10 times by 6 is 60
2 times by 7 is 14	5 times by 7 is 35	10 times by 7 is 70
2 times by 8 is 16	5 times by 8 is 40	10 times by 8 is 80
2 times by 9 is 18	5 times by 9 is 45	10 times by 9 is 90
2 times by 10 is 20	5 times by 10 is 50	10 times by 10 is 100
2 times by 11 is 22	5 times by 11 is 55	10 times by 11 is 110
2 times by 12 is 24	5 times by 12 is 60	10 times by 12 is 120
3 Times Table	**4 Times Table**	
3 times by 1 is 3	4 times by 1 is 4	
3 times by 2 is 6	4 times by 2 is 8	
3 times by 3 is 9	4 times by 3 is 12	
3 times by 4 is 12	4 times by 4 is 16	Try different ways of learning the times tables e.g. Singing, making a rap, objects etc. There are also some great websites and apps available. Try visiting the school's learning platform to find some suggestions.
3 times by 5 is 15	4 times by 5 is 20	
3 times by 6 is 18	4 times by 6 is 24	
3 times by 7 is 21	4 times by 7 is 28	
3 times by 8 is 24	4 times by 8 is 32	
3 times by 9 is 27	4 times by 9 is 36	
3 times by 10 is 30	4 times by 10 is 40	
3 times by 11 is 33	4 times by 11 is 44	
3 times by 12 is 36	4 times by 12 is 48	

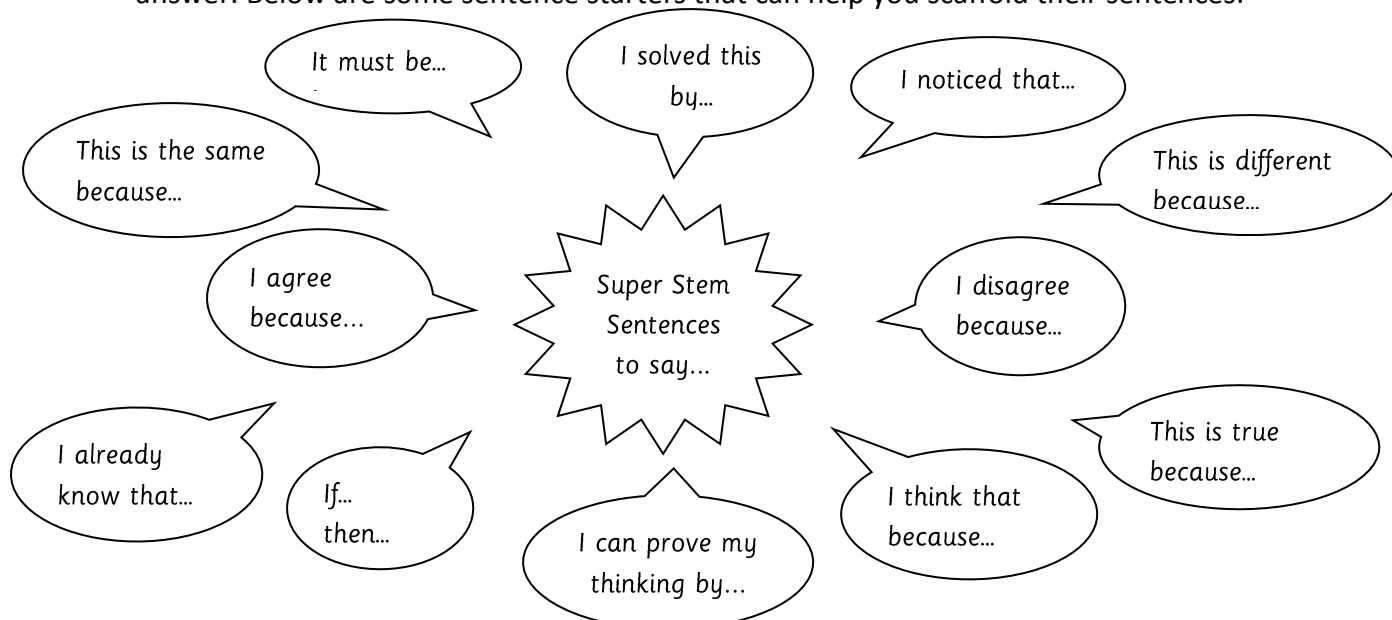# Questions that can help to extend children's thinking

Asking questions is a great way of understanding your child's thinking. It can give you a real insight into their learning and help you to understand if they are making errors.

Remember not to only ask when children go wrong, but also to explain why they are correct. This encourages them to always think deeply.
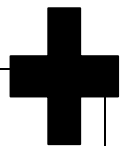
When getting started:	To ask when stuck:
• How are you going to tackle this?	• Describe the problem in your own words?
• What information do you have?	• Talk me through what you have done so far?
• What do you need to find out?	• What did you do last time?
• What operation/s are you going to use?	• What is different this time?
• Will you do it mentally? Why?	• Is there something that you already know that might help?
• What method are you going to use? Why?	• Is there some equipment that might help?
• What equipment will you need?	• Could you try it with simpler numbers?
• What questions will you need to ask?	• What about putting things in order?
• How are you recording what you are doing?	• Would a picture/diagram help?
• What do you think the answer or result will be?	• Why not make a guess and check it works?
• Can you make an estimate or prediction?	
To check progress while working:	**When finished working:**
• Can you explain what you have done so far?	• How did you get your answer?
• What else is there to do?	• How could you check it?
• What could you try next?	• Can you describe your method to me?
• Why did you decide to use this method?	• Can you explain why it works?
• Why did you do it this way?	• Would it work with different numbers?
• Can you think of another method that might have worked?	• What if you started with…?
• Could there be a quicker way of doing this?	• What if you could only use…?
• What do you mean by…?	• What have you learnt from this?
• What did you notice when…?	• If you were doing it again, what would you do differently?
• Why did you organise your results like that?	• Having done this, when could you use this strategy again?
• Are you beginning to see a pattern?	• Did you use any new words? What do they mean? Can you spell them?
• Do you think that this would work with other numbers?	• What are the key points or ideas that you need to remember for next time?
• Have you thought of all the possibilities?	
• How can you be sure?	

Speaking in sentences

When your child answers you encourage them to use a whole sentence rather than just a one word answer. Below are some sentence starters that can help you scaffold their sentences:

It must be…

I solved this by…

I noticed that…

This is the same because…

This is different because…

I agree because…

Super Stem Sentences to say…

I disagree because…

I already know that…

If… then…

I can prove my thinking by…

I think that because…

This is true because…

Calculation Guidance

First: Count All

Children count three counters and then five counters and then find the total by counting all the counters.

$$3 + 5 = 8$$

- Children use practical methods to discover about addition e.g. biscuits are added to a plate
- Children have lots of opportunities to count on in ones using rhymes.
- Children use part/part whole model to record their calculations and discover 3+5=5+3
- Children concentrate on numbers to 10 then 20.
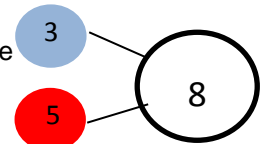
Then: Count On

Children count on from the biggest number using a numbered line or a 100 square. 5+3=8

1	2	3	4	5	6	7	8	9	10
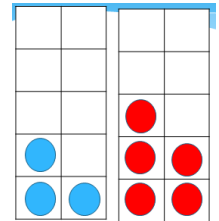
- Children continue to use practical equipment to aid their adding e.g. tens frames
- Children use mental counting on using their fingers to aid.
- Children write their own number sentences e.g. 3 + 5 = 8 or 8 = 5 + 3
- Children concentrate on numbers to 20 then 100.

Next: Partitioning Practically

Children split up the smaller number into tens and ones using practical equipment to help e.g. Dienes cubes, partitioning cards or coins. Then they recombine the numbers back together to find the answer.

25
20 5

12
10 2

$$25 + 12 = 37$$

They will use this skill to count on using their own number line. 34 + 23 = 57

+10   +10   +1 +1 +1
34   44   54 55 56 57
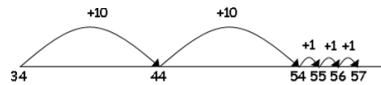
Finally: Expanded Addition

Children are taught to continue to partition and write in a more formal method when dealing with larger numbers.

25 + 12 = 37
20 + 10 = 30
5 + 2 = 7

Children partition each number, set them out in columns and then recombine for the answer.

| 25 + 12 = 37 |
|---|
| 25 + 10 = 35 |
| 35 + 2 = 37 |

First: Counting What's Left

Children start with six objects then take two away finding the answer by counting how many are left.

- Children use practical methods to discover about subtraction e.g. fruit left on a plate.
- Children have lots of opportunities to count back in ones using rhymes.
- Children use the part/part whole to record their calculations using addition skills learnt to aid
- Children concentrate on numbers to 10 then 20.
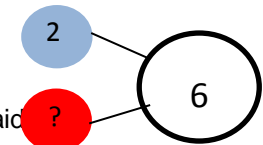
Then: Count Back

Children count back from the biggest number using a numbered line or a 100 square. 9 – 4 = 5

1	2	3	4	5	6	7	8	9	10
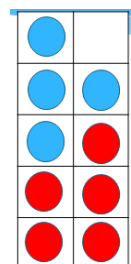
- Children use practical equipment to aid their subtraction e.g. tens frames
- Children use mental counting back using their fingers to aid.
- Children write their own number sentences e.g. 9 – 4 = 5
- Children concentrate on numbers to 20 then 100.

Next: Partitioning Practically

Children continue to use practical equipment to aid their partitioning e.g. Dienes cubes, partitioning cards or coins.
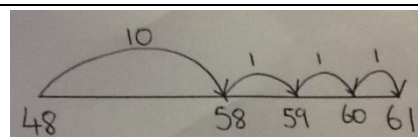
$$36 - 15 = 21$$

36 - 15 = 21
30 - 10 = 20
6 - 5 = 1

42 - 39 = 3
42 - 30 = 12
12 - 9 = 3

Children may also split up the smaller number into tens and ones and use expanded column subtraction when regrouping is required:

Finally: Difference

Children also use their own number line to count on when finding the difference of two numbers close together. The difference of 48 and 61 is 13.

Also Inverses:

Children should show an understanding that addition is the inverse of subtraction and use this to discover calculations like the following:

If 15 + 5 = 20 then 20 - 15 = 5 and 20 - 5 = 15

First: Doubling

Children will practically double numbers and count all. E.g. Double the 3 spots on the ladybird:
- Children practise counting on in 2's.
- Children concentrate on numbers to 10 and then 20.
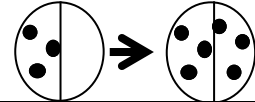
Then: Sets & Groups

- Children continue to use practical equipment to aid their multiplication.
- Children concentrate on counting in 2's, 5's and 10's.

| Children examine adding sets or groups of the same numbers   3 lots of 5 = 15 |

- Teacher demonstrates how to write a simple number sentence e.g. 7x2=14 using the phrase 'lots of'

Next: Arrays

Children examine how multiplication can be modelled using set of the same number and an array:

5 x 3 = 15

3 x 5 = 15
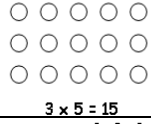
Commutativity
Children should know that 3 x 5 has the same answer as 5 x 3.

Finally: Repeated Addition & Partitioning

Children then use their own number line to repeatedly count on the same number. 5 x 3 = 5 + 5 + 5
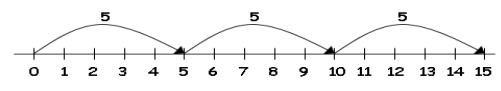
Children are taught to continue to partition the biggest number and multiply the tens and the units. They then recombine the numbers to find the answer.

23 x 5 = 115
20 x 5 = 100
 3 x 5 = 15

Children are also encouraged to learn their times tables by rote.
Beginning with 2, 5 and 10. Then progressing to 3 and 4.

First: Halving

Children start with halving even numbers to 10 and then 20 exploring how a number can be split in 2.
- Children use practical methods to discover about division e.g. Sharing fruit between friends.
- Children are introduced to the concept of a remainder when dealing with odd numbers to test their ideas of sharing fairly.
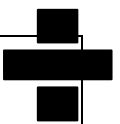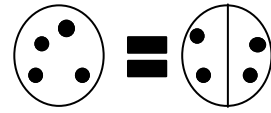
Then: Sharing

Children share numbers fairly between sets to find the answer. 6 ÷ 2 = 3
- Children use practical equipment to aid their division e.g. cubes
- Children concentrate on sharing in 2's, 5's and 10's
- Teacher demonstrates how to write a simple number sentence e.g. 10÷2=5 using the phrase 'shared by.'
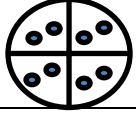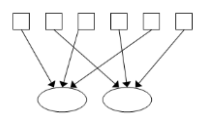
This method is also used for fractions of numbers by drawing quadrants to share between.
¼ of 8 = 2

Next: Grouping
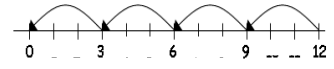
Children group a number into sets to find how many sets are made. 6 ÷ 2 = 3

They are also asked to group random objects into a set number sometimes showing remainders. Put these 7 stars in groups of 2

Finally: Repeated subtraction

Children use their own number line to count back the same step to discover how many jumps are needed to reach 0.   12 ÷ 3 = 4

Also Inverses:

Children should begin to see the relationship between multiplication and division as the inverse of one another. Starting with halving being the opposite of doubling and then progressing to using their times tables.

This is an overview of the strategies used throughout your child's whole time at Whitestone. Children are **not** expected to achieve all of this in one year, but work through the different strategies when they are ready to do so. They may understand one strategy more than another and are encouraged to choose which one works best for them or is most appropriate for the calculation.