St. Mary's Mathematics Vision

At St. Mary's we passionately believe in the mathematical potential of all our young people. Learning mathematics at St. Mary's has its own intrinsic value, and our mathematics framework supports this, ensuring that all students will develop an enjoyment of mathematics and an appreciation of its relevance and importance today. In addition, we believe that education should provide pupils with the attitudes, mind-sets and adaptive cognition to allow them to be successful lifelong learners.

Through our vibrant and engaging discussions, our St. Mary's mathematical framework along with our inclusive community will allow all pupils to become confident in their conceptual understanding of mathematics, will reason mathematically and will apply their mathematics to solve challenging problems.

We strive for every pupil, by the end of St. Mary's, to have grown their fluency in the fundamentals of mathematics, their mathematical attitudes and adaptive thinking to achieve their future aspirations enabling them to flourish, have choices and excel. Our high-quality mathematics curriculum enables our pupils to understand the world, that they are part of, allowing them to decide how they want to contribute to our future.

St. Mary's Mathematics Framework – *End Points*

Attitudes & Mindsets

Pupils have developed a mathematical mindset and established a positive attitude towards mathematics. That allows them to appreciate the importance, beauty and awe of mathematics in the world and its usefulness in modern life; have had the opportunity to utilise their mathematical thinking and reasoning skills.

Heuristics, Problem Solving & Reasoning

Pupils can explore novel mathematical situations and construct solutions using a bank of strategies and the confidence to select the most appropriate and efficient one for any given routine or non-routine task across different contexts.

Conceptual Understanding

Pupils have acquired a conceptual understanding of mathematics through a process of epistemic ascent, where they are proficient in solving problems; have a deep understanding of the structures, visual patterns and calculation strategies required to succeed with the KS3 curriculum and beyond.

At St. Mary's we grow flourishing mathematicians

Adaptive Cognition

Pupils are motivated to use their adaptive cognition and meta-cognition to plan, monitor and evaluate their deep mathematical thinking. Able to make strategic choices, links, generalisations and build connections across big mathematical ideas, strands, subjects and the world.

Fluency

Pupils are able to fluently recall numerical calculations, measurement facts, algebraic manipulations, spatial visualisation, estimation and many other mathematical facts required to succeed with the KS3 curriculum and beyond.

Communication & Language

Pupils are able to communicate, explain, question, justify and prove their understanding using mathematical terminology and notation. They have the fluency in the vocabulary required to describe and illustrate mathematical processes, concepts and their thinking. Pupils appreciate mathematics is a language to see the world with new eyes.

Sources: Drury H. (2014) Mastering Mathematics, Teaching to transform achievement, OUP ISBN: 978-0-19-835175-7; IOE, Singapore (1990-2003); McCourt M. (2019) Teaching for Mastery; Sommerhoff D. (2017); NCETM Maths Hub

St. Mary's Mathematics Framework – Child Friendly

Attitudes & Mindsets
Mathematics has value
I can see beauty in mathematics.
I can enjoy mathematics.
I can persevere in mathematics.

Heuristics, Problem Solving & Reasoning
Mathematics solves problems
I can act out/sketch/model the problem
I can use my understanding, proficiency of heuristics and strategies to help me reason towards possible solutions to problems.

At St. Mary's we grow flourishing mathematicians

Conceptual Understanding
Mathematics is rich in knowledge
I can compare numbers
I can identify different polygons
I can learn new mathematical concepts.
I am curious about mathematics.

Adaptive Cognition
Mathematics is all connected
I can connect new mathematical thinking to my prior knowledge.
I can reflect on my mathematical thinking.
I can visualise my mathematical thinking.

Fluency
Mathematics has fundamental truths
I can recall mathematical facts.
I can recall measurement facts.
I can make an estimation.

Communication & Language
Mathematics is is a language
I can explain my thinking using mathematical vocabulary.
I can communicate my thinking to others.

St. Mary's Mathematics Framework - Child Friendly

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Mathematics solves problems

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Mathematics is all connected

I can connect new mathematical thinking to my prior knowledge.
I can reflect on my mathematical thinking.
I can visualise my mathematical thinking.

Mathematics has fundamental truths

I can recall mathematical facts.
I can recall measurement facts.
I can make an estimation

Progression map

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
 **End Point One** Pupils have developed a mathematical mindset and established a positive attitude towards mathematics. That allows them to appreciate the importance, beauty and awe of mathematics in the world and its usefulness in modern life; have had the opportunity to utilise their mathematical thinking and reasoning skills.	I know how to enjoy working on simple tasks with help. - I know how a person can learn to do something tricky in different ways GM I know how to describe how you feel when learning or doing something difficult GM I know how to identify how people feel when they find come to difficulties GM I can suggest ways of encouraging myself and others to try again GM I can identify things I find challenging; set challenges for myself that I can work towards GM I can identify characteristics of different mindsets GM I can suggest ideas for how a character can develop a growth mindset GM I know how to tackle difficulty, set personal challenges and take risks GM	I know how to enjoy working on simple mathematical tasks with help. I know how to role play using shopping. - I know the characteristics of a growth and fixed mindset GM I know what to suggest to help develop a growth mindset GM I know how it feels to fail; can suggest ways to support others and learn new things GM I know what learning means; describe the learning journey GM I know what happens to our brains when we learn I can identify an aspect of my learning that I would like to improve GM I know what a growth mindset is GM	I know how to follow instructions, practise safely and work on simple tasks by myself. I try several times if at first I don't succeed I know how to ask for help when appropriate. I know how the beauty of mathematics can be found in art I know how to role play using shopping and saving as themes. - I know how to help a child with a fixed mindset GM I know what it feels like when we make a mistake; strategies which help us learn GM I know how to respond to a mistake GM I know the characteristics of effort GM I know how to set and review the progress of learning challenges GM I know the different stages of effort GM	I know why mathematics is important for everyday life and can discuss examples I try several times if at first I don't succeed I know how to ask for help when appropriate. I know why curiosity is important in mathematics I know how the beauty of mathematics can be found in nature - I know how someone feels when they fail; can encourage them GM I know what happens in the brain when we learn I know the characteristics of a growth and fixed mindset GM I know the importance of mistakes in the learning journey GM I know how to overcome challenging areas and barriers to learning GM I know how to overcome failure in different contexts GM	I know why mathematics is important and can name a variety of different careers that require mathematics; can make links between careers and subjects at school. I know why saving and delayed gratification is important I know how the beauty of mathematics can be found in science I know where I am with my learning and I have begun to challenge myself. - I know that failure is an important part of the learning journey I know when to use strategies for persevering and learning GM I know words that can restrict learning GM I know the characteristics of an effective learner GM I know the characteristics of a growth and fixed mindset GM	I know why mathematics is critical to science, technology and engineering, and necessary for financial literacy I know how to think about my personal preferences to subjects and related careers. I know about saving with a bank and consider what bills adults pay. I know how to identify patterns in nature. I know why budgeting is important. I cope well and react positively when things become difficult. I can persevere with a task and improve my performance through regular practice. - I know how to reflect on the different mindsets; when to use them GM I know what to suggest to help someone learn GM I know the characteristics of a successful teacher GM I know how the brain works GM I know what it means to be a failure GM I know what happens when you learn GM	I can reflect on my own strengths and weaknesses when considering my skills and knowledge and career preferences. I know about loans, interest and tax. I can name and describe famous mathematical patterns. I can create my own learning plan and revise that plan when necessary. I can accept critical feedback and make changes. I see all new challenges as opportunities to learn and develop. I recognise my strengths and weaknesses and can set myself appropriate targets. - I know the impact words and phrases have on mindset GM I know how to identify barriers to my learning GM I know how to overcome barriers to learning GM I know how to reflect on the opinion of others GM I know how mistakes can help us learn GM	Maths is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world.

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
 **End Point Two** Pupils have acquired a conceptual understanding of mathematics through a process of epistemic ascent, where they are proficient in solving problems; have a deep understanding of the structures, visual patterns and calculation strategies required to succeed with the KS3 curriculum and beyond.	Cardinality and Number - exploration of two key aspects that support the foundations for further mathematics learning Numerical Patterns - examination of the different aspects of pattern including numerical patterns that underpin early algebra	In addition to the NC aims (teaching sequence below) **Number, Calculation - addition and subtraction** • Comparison of quantities and measures • Introducing 'whole' and 'parts': part-part-whole • Composition of numbers: 0-5 • Composition of numbers: 6-10 • Additive structures: introduction to aggregation and partitioning • Additive structures: introduction to augmentation and reduction • Addition and subtraction: strategies within 10 • Composition of numbers: multiples of 10 up to 100 • Composition of numbers: 20-100 • Composition of numbers: 11-19 **Calculation -multiplication and division** • Counting, unitising and coins • Represent calculations and numbers using concrete resources and pictorial representations	In addition to the NC aims (teaching sequence below) **Number, Calculation - addition and subtraction** • Addition and subtraction: bridging 10 • Subtraction as difference • Addition and subtraction: two-digit and • single-digit numbers • Addition and subtraction: two-digit numbers and multiples often **Calculation - multiplication and division** • Structures: multiplication representing equal groups • Times tables: groups of 2 and commutativity (part 1) • Times tables: groups of 10 and of 5, and factors of O or 1 • Commutativity (part 2), doubling and halving • Structures: quotitive and partitive division **Calculation - addition and subtraction** • Addition: two-digit and two-digit numbers • Subtraction: two-digit and two-digit numbers	In addition to the NC aims (teaching sequence below) **Number, Calculation - addition and subtraction** • Composition and calculation: 100 and bridging 100 • Composition and calculation: three-digit numbers • Securing mental strategies: calculation up to 999 **Calculation - multiplication and division** • Times tables: 2, 4 and 8, and the relationship between them **Number, Calculation – addition** • Algorithms: column addition **Calculation - multiplication and division** • Times tables: 3, 6 and 9, and the relationship between them **Number, Calculation – subtraction** • Algorithms: column subtraction **Fractions** • Preparing for fractions: the part-whole relationship • Unit fractions: identifying, representing and comparing	In addition to the NC aims (teaching sequence below) **Number, Calculation - addition and subtraction** • Composition and calculation: 1,000 and four-digit numbers **Calculation - multiplication and division** • Connecting multiplication and division, and the distributive law • Times tables: 11 and 12 • Division with remainders • Calculation: multiplying and dividing by 10 or 100 **Number, Calculation - addition and subtraction** • Composition and calculation: tenths • Composition and calculation: hundredths and thousandths • Addition and subtraction: money **Calculation - multiplication and division** • Multiplication: partitioning leading to short multiplication • Division: partitioning leading to short division • Multiplicative contexts: area and perimeter 1	In addition to the NC aims (teaching sequence below) **Number, Calculation - addition and subtraction** • Composition and calculation: multiples of 1,000 up to 1,000,000 • Negative numbers: counting, comparing and calculating • Common structures and the part-part-whole relationship • Using equivalence and the compensation property to calculate **Calculation - multiplication and division** • Using equivalence to calculate • Calculation: x/+ decimal fractions by whole numbers • Multiplication with three factors and volume • Factors, multiples, prime numbers and composite numbers • Combining multiplication with addition and subtraction **Fractions** • Finding equivalent fractions and simplifying fractions • Common denomination: more adding and subtracting **Number, Calculation - addition and subtraction**	In addition to the NC aims (teaching sequence below) **Number, Calculation - addition and subtraction** • Composition and calculation: numbers up to 10,000,000 **Calculation - multiplication and division** • Multiplication strategies for larger numbers and long multiplication • Division: dividing by two-digit divisors • Using compensation to calculate **Fractions** • Multiplying fractions and dividing fractions by a whole number • Linking fractions, decimals and percentages **Calculation - multiplication and division** • Mean average and equal shares • Scale factors, ratio and proportional reasoning • Combining division with addition and subtraction • Decimal place-value knowledge, multiplication and division	Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
			• Represent calculations and numbers using concrete resources and pictorial representations	• Non-unit fractions: identifying, representing and comparing • Adding and subtracting within one whole **Calculation - multiplication and division** • Times tables: 7 and patterns within/across times tables • Represent calculations and numbers using concrete resources and pictorial representations • Write formal and informal expressions and equations.	**Fractions** • Working across one whole: improper fractions and mixed numbers • Multiplying whole numbers and fractions **Calculation - multiplication and division** • Structures: using measures and comparison to understand scaling • Use concrete, pictorial and abstract representations as necessary.	• Composition and calculation: numbers up to 10,000,000 **Calculation - multiplication and division** • Multiplication strategies for larger numbers and long multiplication • Division: dividing by two-digit divisors • Using compensation to calculate **Fractions** • Multiplying fractions and dividing fractions by a whole number • Linking fractions, decimals and percentages **Calculation - multiplication and division** • Mean average and equal shares • Scale factors, ratio and proportional reasoning • Combining division with addition and subtraction • Decimal place-value knowledge, multiplication and division • Multiplicative contexts: area and perimeter 2 **Number, Calculation - addition and subtraction** • Problems with two unknowns • Use concrete, pictorial and abstract representations as necessary	• Multiplicative contexts: area and perimeter 2 **Number, Calculation - addition and subtraction** • Problems with two unknowns • Use concrete, pictorial and abstract representations as necessary.	

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
 **End Point Three** Pupils are able to communicate, explain, question, justify and prove their understanding using mathematical terminology and notation. They have the fluency in the vocabulary required to describe and illustrate mathematical processes, concepts and their thinking. Mathematics is a language of seeing the world with new eyes.	**Mathematical vocabulary** **Number** zero number one, two, three … to twenty and beyond teens numbers, eleven, twelve … twenty 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	Mathematical notation Cloze Sentences Listening I know how to work with others and take turns speaking and listening Written **Mathematical vocabulary** **Number** numeral twenty-one, twenty-two … one hundred forwards backwards equal to equivalent to most, least many multiple of **Place value** equal to half-way between above, below **Estimating** roughly **Addition and subtraction** addition near double half, halve subtract equals is the same as number bonds/pairs missing number **Multiplication and division** multiplication multiply multiplied by multiple division dividing	Mathematical notation Cloze Sentences Listening I know how to work with others and take turns speaking and listening and share my help I know how to work sensibly with others, taking turns and giving advice I know how to help, praise and encourage others in their mathematical learning Oracy Written, artwork **Mathematical vocabulary** **Number** two hundred … one thousand threes, fours and so on tally sequence continue predict rule > greater than < less than **Place value** hundreds one-, two- or three-digit number place, place value stands for, represents exchange twenty-first, twenty-second …	Mathematical notation Cloze Sentences Listening I know how to show patience and support my peers by listening carefully to their mathematical reasoning Oracy Written, artwork and performing **Mathematical vocabulary** **Number** eights, fifties and so on to hundreds factor of relationship Roman numerals **Place value** one hundred more one hundred less **Estimating** approximate, approximately round, nearest, round to the nearest ten, hundred round up, round down **Addition and subtraction** addend minuend subtrahend hundreds boundary **Multiplication and division** factor product remainder **Fractions**	Mathematical notation Cloze Sentences Listening I know why it is important to be happy to show and tell others about my mathematical ideas Oracy Written, artwork and performing **Mathematical vocabulary** **Number** ten thousand, hundred thousand, million sixes, sevens, nines, twenty-fives next, consecutive integer, positive, negative above/below zero, minus negative numbers **Place value** one thousand more one thousand less **Estimating** thousand **Addition and subtraction** inverse **Multiplication and division** inverse square, squared cube, cubed divisor quotient dividend **Fractions** hundredths	Mathematical notation Cloze Sentences Listening I know how to cooperate well with others and give helpful feedback. I know how to help organise roles and responsibilities and can guide a small group solve a mathematical task/problem Oracy Explaining and justifying Written, artwork and performing Explaining and justifying **Mathematical vocabulary** **Number** factor pair ≥ greater than or equal to ≤ less than or equal to formula divisibility square number prime number ascending/descending order **Place value** *revisit previous years* **Estimating** ten thousand **Addition and subtraction** ones boundary, tenths boundary **Multiplication and division** *revisit previous years*	Justify efficient methods and prove efficiency (could be done through a journaling approach). I know how to give and receive feedback to improve myself and others. I know how to explain and justify and collaborate appropriately Mathematical notation Cloze Sentences Oracy Written, artwork and performing **Mathematical vocabulary** **Number** factorise prime factor digit total **Place value** *revisit previous years* **Estimating** *revisit previous years* **Addition and subtraction** *revisit previous years* **Multiplication and division** *revisit previous years*	**reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

	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 **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 **Multiplication and division** sharing doubling halving number patterns **Fractions** parts of a whole half quarter **MEASUREMENT**	grouping array **Fractions** fraction equal part equal grouping equal sharing one of two equal parts one of four equal parts **MEASUREMENT** measurement roughly **Length** centimetre ruler metre stick **Weight** kilogram, half kilogram **Capacity and volume** litre, half litre capacity volume more than less than quarter full **Time** months 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	**Estimating** exact, exactly **Addition and subtraction** one hundred more one hundred less number facts tens boundary **Multiplication and division** 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 … ten each group in pairs, threes … tens equal groups of row, column multiplication table multiplication fact, division fact **Fractions** equivalent fraction mixed number numerator, denominator two halves two quarters, three quarters one third, two thirds one of three equal parts **MEASUREMENT** measuring scale **Length** further, furthest tape measure **Weight** gram	sixths, sevenths, eighths, tenths … **MEASUREMENT** division approximately **Length** millimetre, kilometre, mile distance apart … between … to … from perimeter **Weight** *revisit previous years* **Capacity and volume** *revisit previous years* **Temperature** centigrade **Time** century calendar earliest, latest a.m., p.m. Roman numerals 12-hour clock time, 24-hour clock time **Money** *revisit previous years* **GEOMETRY** **Properties of shape** perimeter **2-D Shape** pentagonal hexagonal octagonal quadrilateral right-angled parallel, perpendicular	decimal, decimal fraction, decimal point, decimal place, decimal equivalent proportion **MEASUREMENT** unit, standard unit metric unit **Length** breadth edge area, covers square centimetre (cm2) **Weight** mass: big, bigger, small, smaller weight: heavy/light, heavier/lighter, heaviest/lightest **Capacity and volume** measuring cylinder **Temperature** *revisit previous years* **Time** leap year, millennium noon date of birth timetable, arrive, depart **Money** *revisit previous years* **GEOMETRY** **Properties of shape** line construct, sketch centre angle, right-angled base, square-based reflect, reflection regular, irregular **2-D Shape** 2-D, two-dimensional	**Fractions** proper/improper fraction equivalent, reduced to, cancel thousandths in every, for every percentage, per cent, % **MEASUREMENT** imperial unit **Length** square metre (m^2), square millimetre (mm^2) **Weight** *revisit previous years* **Capacity and volume** pint, gallon **Time** *revisit previous years* **Money** discount currency **GEOMETRY** **Properties of shape** radius, diameter congruent axis of symmetry, reflective symmetry congruent **2-D Shape** x-axis, y-axis, quadrant **3-D Shape** octahedron **Position and direction** coordinate protractor **STATISTICS** database bar line chart line graph maximum/minimum value outcome	**Fractions** ratio **Algebra** formulae equation unknown variable **MEASUREMENT** *revisit previous years* **Length** yard, foot, feet, inch, inches circumference **Weight** tonne, pound, ounce **Capacity and volume** centilitre cubic centimetres(cm^3), cubic metres (m^3), cubic millimetres (mm^3), cubic kilometres (km^3) **Temperature** *revisit previous years* **Time** Greenwich Mean Time, British Summer Time, International Date Line **Money** profit, loss **GEOMETRY** **Properties of shape** circumference, concentric, arc net, open, closed intersecting, intersection plane **2-D Shape** kite	

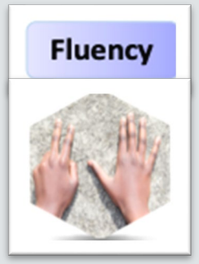
	measure size compare guess, estimate enough, not enough too much, too little too many, too few nearly, close to, about the same as just over, just under **Length** metre length, height, width, depth long, short, tall high, low wide, narrow thick, thin longer, shorter, taller, higher … and so on longest, shortest, tallest, highest … and so on far, near, close **Weight** weigh, weighs, balances heavy, light heavier than, lighter than heaviest, lightest scales **Capacity and volume** full empty half full holds container **Time** time days of the week, Monday, Tuesday … hour hand, minute hand hours, minutes **Money** change dear, costs more cheap, costs less, cheaper costs the same as how much …? how many …? total **GEOMETRY** **Properties of shape** symmetry, symmetrical pattern **2-D Shape** point, pointed **3-D Shape** cuboid cylinder **Position and direction** underneath centre journey quarter turn, three-quarter turn **STATISTICS** vote table **GENERAL** problem, problem solving mental, mentally explain your thinking	**Capacity and volume** millilitre contains **Temperature** temperature degree **Time** fortnight 5, 10, 15 … minutes past digital/analogue clock/watch, timer seconds **Money** bought sold **GEOMETRY** **Properties of shape** surface line symmetry **2-D Shape** rectangular circular triangular pentagon hexagon octagon **3-D Shape** *revisit previous years* **Position and direction** route higher, lower clockwise, anticlockwise right angle straight line **STATISTICS** tally graph, block graph, pictogram represent label, title	**3-D Shape** hemisphere prism, triangular prism **Position and direction** compass point north, south, east, west, N, S, E, W horizontal, vertical, diagonal angle … is a greater/smaller angle than acute angle obtuse angle **STATISTICS** chart, bar chart, frequency table Carroll diagram, Venn diagram axis, axes diagram **GENERAL** greatest value, least value statement	oblong rectilinear equilateral triangle, isosceles triangle, scalene triangle heptagon parallelogram, rhombus, trapezium polygon **3-D Shape** 3-D, three-dimensional spherical cylindrical tetrahedron, polyhedron **Position and direction** north-east, north-west, south-east, south-west, NE, NW, SE, SW translate, translation rotate, rotation degree reflection ruler, set square angle measurer, compass **STATISTICS** survey, questionnaire, data **GENERAL** justify make a statement	**GENERAL** explain your reasoning	**3-D Shape** dodecahedron net, open, closed **Position and direction** reflex angle **STATISTICS** pie chart mean (mode, median, range as estimates for this) statistics, distribution **GENERAL** *revisit previous years*	

	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 **GEOMETRY** **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		most popular, most common least popular, least common **GENERAL** show how you … explain your method describe the pattern describe the rule investigate mental calculation written calculation					

	corner, side rectangle (including square) circle triangle 3-D shape face, edge, vertex, cube pyramid sphere cone **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 **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							

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
 **End Point Four** Pupils can explore novel mathematical situations and construct solutions using a bank of strategies and the confidence to select the most appropriate and efficient one for any given routine or non-routine task across different contexts.		**To give a representation:** draw a diagram make a list **To make a calculated guess:** guess and check look for pattern(s) **To go through the process:** act it out use a bead string use a ten frame use partition models use dienes **To change the problem:** simplify the problem	**To give a representation:** draw a diagram make a list **To make a calculated guess:** guess and check look for pattern(s) make suppositions **To go through the process:** act it out use a twenty frame use a number line use PV tokens use groups of dienes use numicon to make mathematical patterns **To change the problem:** restate the problem simplify the problem solve part of the problem	• Experiences of different methods to solve one problem – strive to show this at all opportunities possible within the Year 3 curriculum. **To give a representation:** • Decomposition and partitioning • Bar modelling for addition and subtraction • Bar modelling for multiplication and division • Draw bars to represent simple fractions • Position numbers onto a blank number line • Visualising **To go through the process:** • Working in order • use PV tokens on a ten frame • use a Gattegno chart use groups of dienes **To make a calculated guess:** • Pattern spotting **To change the problem:** • Proving	• Experiences of different methods to solve one problem – strive to show this at all opportunities possible within the Year 4 curriculum. **To give a representation:** • Decomposition and partitioning • Bar modelling for addition and subtraction • Bar modelling for multiplication and division • Draw bars to represent simple fractions • Write calculations to match bar models • Position numbers and fractions onto a blank number line **To make a calculated guess:** • Trial and improvement **To go through the process:** • Working systematically • use tenths PV tokens • use a Gattegno chart with tenths **To make a calculated guess:** • Conjecturing i.e. I know…so…	• Experiences of different methods to solve one problem – strive to show this at all opportunities possible within the Year 5 curriculum. **To give a representation:** • Use bar models to represent more abstract or multi step problems and derive unknowns. • Use a blank number line to estimate and calculate **To go through the process:** • Working backwards **To make a calculated guess:** • Generalising **To go through the process:** • Working systematically • use hundredths PV tokens • use a Gattegno chart with hundredths **To make a calculated guess:** • Conjecturing i.e. I know…so…	• Experiences of different methods to solve one problem – strive to show this at all opportunities possible within the Year 6 curriculum. **To give a representation:** • Use bar models to represent increasingly abstract problems and derive calculations and answers from them independently. **To go through the process:** • Deriving formulae from generalisations	**reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
 **End Point Five** Pupils are able to fluently recall numerical calculations, measurement facts, algebraic manipulations, spatial visualisation, estimation and many other mathematical facts required to succeed with the KS3 curriculum and beyond.	EP5 split	KIRFs Know number bonds for each number to 10. (SUM2) Tell the time. (SUM1) Know number bonds to 10. (SPR2) Know doubles and halves of numbers to 10. (SPR1) Know number bonds for each number to 6. (AUT2)	KIRFs Know the multiplication and division facts for the 5 times table. (SUM2) Tell the time. (SUM1) Know the multiplication and division facts for the 10 times table. (SPR2) Know doubles and halves of numbers to 20. (SPR1) Know the multiplication and division facts for the 2 times table. (AUT2) I know number bonds to 20. (AUT1)	KIRFs Know the multiplication and division facts for the 8 times table. (SUM2) I can tell the time. (SUM1) Know the multiplication and division facts for the 4 times table. (SPR2) Recall facts about durations of time. (SPR1) Know the multiplication and division facts for the 3 times table. (AUT2) Know number bonds for all numbers to 20. (AUT1) • Estimate through rounding to the nearest 10 and 100.	KIRFs Multiply and divide single-digit numbers by 10 and 100. (SUM2) Know the multiplication and division facts for the 7 times table. (SUM1) Recognise decimal equivalents of fractions. (SPR2) Know the multiplication and division facts for the 9 and 11 times tables. (SPR1) Know the multiplication and division facts for the 6 times table. (AUT2) Know number bonds to 100. (AUT1) • Estimate through rounding to the nearest 1000. • Use rounding and adjust.	KIRFs Find factor pairs of a number. (SUM2) Recall square numbers up to 122 and their square roots. (SUM1) Identify prime numbers up to 20. (SPR2) Recall metric conversions. (SPR1) Know the multiplication and division facts for all times tables up to 12 × 12. (AUT2) Know decimal number bonds to 1 and 10. (AUT1)	KIRFs Identify prime numbers up to 50. (SPR2) Convert between decimals, fractions and percentages. (SPR1) Identify common factors of a pair of numbers. (AUT2) Know the multiplication and division facts for all times tables up to 12 × 12. (AUT)	Can solve problems by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
		To know the Visual Number Foundations *(Stg.1 NSM Number Facts) (NCTEM Spines: 1.3 Composition of numbers 0 – 5 1.4 Composition of numbers 6 – 10)* To be able to Make and Break Numbers to 10 *(Stg.2 NSM Number Facts) (NCTEM Spines: 1.3 & 1.4)* To know the Facts and Strategies Within 10 *(Stg.3 NSM Number Facts) (NCTEM Spines: 1.7 Addition and subtraction: strategies within 10)* To know the Ten and A Bit Facts *(Stg.4 NSM Number Facts) (NCTEM Spines: 1.10 Composition of numbers 11 – 19)*	Know the Facts and Strategies Across 10 *(Stg.5 NSM Number Facts) (NCTEM Spines: 1.11 Addition and subtraction: bridging 10)* To be able to Extend Facts and strategies Beyond the Grids *(Stg.6 NSM Number Facts) (NCTEM Spines: 1.13 Addition and subtraction: two-digit and single digit numbers 1.14 Addition and subtraction: two-digit numbers and multiples of ten)*					
	Cardinality and Number - exploration of two key aspects that support the foundations for further mathematics learning							

End point(s)	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Link to NC
 **End Point Six** Pupils are motivated to use their adaptive cognition and meta-cognition to plan, monitor and evaluate their deep mathematical thinking. Able to make strategic choices, links, generalisations and build connections across big mathematical ideas, strands, subjects and the world.	I can follow simple instructions.	I can follow simple instructions.	I can understand and follow simple rules. I can name some things I am good at.	I can begin to order instructions and steps. With help, I can recognise similarities and differences and explain why that solution is working or performing well.	I can explain what I am doing well and I have begun to identify areas for improvement.	I can understand ways (criteria) to judge my performance and I can identify specific parts to continue to work upon. I can use my awareness of reasoning and heuristics to make good decisions. I can review, analyse and evaluate my own and others' strengths and weaknesses and I can read and react to different problems as they arise. Identify efficient methods from a range of known methods. Make and describe generalisations from observations.	I can review, analyse and evaluate my own and others' strengths and weaknesses and I can read and react to different problems as they arise. I have a clear idea of how to develop my own and others' work. I can recognise and suggest patterns which will increase chances of success and I can develop my own methods. I can respond imaginatively to different situations, adapting and adjusting my reasoning Make and use generalisations to solve problems and estimate.	**National Centre for Excellence in the Teaching of Mathematics (NCETM)** The mathematics developed in this century will be the basis for the technological and scientific innovations developed in the next one. The thought processes, the ways of looking at things, the habits of mind used by mathematicians, computer scientists and scientists will be mirrored in systems that will influence almost every aspect of our daily lives. If we want to empower our students for life after school, we need to prepare them to be able to use, understand, control and modify a class of technology that doesn't yet exist. That means we have to help them develop genuinely mathematical ways of thinking.