

St Lawrence C of E (Aided) Junior School

Mathematics Policy

Introduction

St Lawrence C of E (Aided) Junior School uses the mastery approach to the teaching and learning of mathematics. The rationale behind this approach lies within the research of Guskey (2009) and Skemp (1976), the Mathematics Specialist Teacher Programme, the NCETM/Maths Hub led Mastery Specialist Programme as well as the 2014 National Curriculum, which states:

The expectation is that most pupils will move through the programme of study at broadly the same pace. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

5 Big Ideas

Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas. Opportunities for Mathematical Thinking allow children to make chains of reasoning connected with the other areas of their mathematics. A focus on Representation and Structure ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns as well as specialise and generalise while problem solving. Coherence is achieved through the planning of small connected steps to link every question and lesson within a topic. Teachers use both procedural and conceptual variation within their lessons and there remains an emphasis on Fluency with a relentless focus on number and times table facts.

8 Classroom Norms to Establish

1. Everyone can learn mathematics to the highest levels
2. If you 'can't do it' you 'can't do it yet'
3. Mistakes are valuable
4. Questions are important
5. Mathematics is about creativity and problem solving
6. Mathematics is about making connections and communicating what we think
7. Depth is much more important than speed
8. Maths lessons are about learning, not performing

Teaching for Mastery Principles

- Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage
- The whole class is taught mathematics together, with no differentiation by acceleration to new content. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge
- Factual knowledge (e.g. number bonds and times tables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. of place value) are taught in a fully integrated way and are all seen as important elements in the learning of mathematics.

- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail how answers were obtained, why the method/strategy worked and what might be the most efficient method/strategy.
- Interim methods (e.g. expanded methods for addition and multiplication) to support the development of formal written algorithms are used for a short period only, as stepping stones into efficient, compact methods.
- Precise mathematical language, coached in full sentences, is always used by teachers, so that mathematical ideas are conveyed with clarity and precision. Pupils are required to do the same (e.g. when talking about fractions, both the part and its relationship to the whole are incorporated into responses: 'The shaded part of the circle is one quarter of the whole circle').
- Conceptual variation and procedural variation are used throughout teaching, to present the mathematics in ways that promote deep, sustainable learning.
- Carefully devised exercises employing variation are used. These provide intelligent practice that develops and embeds fluency and conceptual knowledge.
- Sufficient time is spent on key concepts (e.g. multiplication and division) to ensure learning is developed and deeply embedded before moving on.
- Curriculum design, programmes of study and lesson content are carefully sequenced, in order to develop a coherent and comprehensive conceptual pathway through the mathematics.
- Learning is broken down into small, connected steps, building from what pupils already know.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. These may include textbooks, visual images and concrete resources.

Features of Teaching

- Lessons are sharply focused: digression is generally avoided. Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within the contexts that make sense to pupils
- Making comparisons is an important feature of developing deep knowledge. The questions 'What's the same, what's different?' are often used to draw attention to essential features of concepts.
- Repetition of key ideas (e.g. in the form of whole class recitation, repeating to talk partners etc) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

Lesson Structure

- In lessons there are opportunities for exploration, structuring, documenting, practice and reflecting.
- An anchor task is used to engage the children in their learning and children are given time to explore the problem (often with concrete materials).
- This problem is discussed deeply and structured by the teacher, using the children's methods when possible, to investigate different ways to solve it. Children evaluate the methods themselves and to try to visualise.
- Enrichment is used over acceleration. Higher attainers should be able to show recordings in more than one way, different possibilities, explain it as a story, verbalise thinking methods and reason ideas etc.
- Guided practice allows children to practice and apply their new knowledge (and methods) to different problems, with support as needed from a peer or adult.
- Children should then be able to apply their understanding to independent tasks, which will need them to use what they have learnt to answer different questions. This may be in a separate practice lesson.

The Maths National Curriculum Programme of Study

St Lawrence follows the New National Curriculum and Programmes of Study for Maths. The following key areas of learning are taught:

- Number and Place Value (including algebra)
- Addition and Subtraction
- Multiplication and Division
- Fractions
- Measurement
- Geometry
- Statistics
- Ratio and Proportion

Attainment Targets

The programmes of study for mathematics are set out year-by-year. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. Pupils are expected to have acquired all the skills, knowledge and concepts securely as outlined in the Key Stage 1 Programme of Study before they come to St Lawrence. The end of year objectives for each year group can be found in **Appendix 1** and agreed common strategies used to teach particular operations and processes are as outlined in our **Calculation policy**.

Lower Key Stage 2

The principal focus of mathematics teaching in Lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including those with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.

Upper Key Stage 2

The principal focus of mathematics teaching in Upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

Mental Maths Skills

The new curriculum has a strong emphasis on 'Arithmetic' and being able to recall mathematical facts instantly, such as number bonds and times tables. At St Lawrence, we recognise the importance of establishing a secure foundation in mental calculations and the recall of number facts before standard written methods are introduced.

End of year expectations for learning the time tables to recall multiplication and division facts are as follows:

Times Tables End of Year Expectation

By the end of Key Stage 1	Year 3	Year 4
Recall and use multiplication and division facts for the 2, 3, 4, 5 and 10 multiplication tables	Recall and use multiplication and division facts for the 2, 3, 4, 5, 6, 8 and 10 multiplication tables	Recall and use multiplication and division facts for multiplication tables up to 12 x 12
Year 5		Year 6
Apply all the multiplication tables up to 12 x 12 and related division facts frequently, commit them to memory and use them confidently to make larger calculations.		Apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.

The school uses Times Table Rock Stars to support and engage children in the learning of their times tables.

Each year group has a half termly targets based on Key Instant Recall Facts (KIRFs). They are particularly useful when calculating: adding, subtracting, multiplying or dividing. These Key Instant Recall Facts are outlined for each Year group and each half term in **Appendix 2**.

'Mental Maths' lessons will take place weekly in order for these recall facts to be both taught, practised and assessed.

Planning

Long Term: The National Curriculum identifies the key objectives that we teach in each year group.

Medium Term: Our medium term plans are designed using 'White Rose Maths' which follows the National Curriculum objectives and breaks them down into blocks across the year. This ensures an appropriate balance and distribution of work across the term.

Short Term: Weekly planning is based on the 'White Rose' small steps guidance but teachers are encouraged to use a variety of resources to design lessons appropriate to the children's needs. Although planned in advance, lessons are adjusted on a daily basis to better suit the needs of a class or individual children. Lessons are planned using slides and a planning cover sheet which provides details of small steps to be covered over the week, key vocabulary and sentence stems. This should be added to over the week to identify any children who have gaps in their knowledge. Children who regularly need support should join an appropriate intervention group.

Resources

A bank of essential mathematics resources including base 10, multi-link, 100 squares and place value counters is kept in each classroom. Further resources relating to key whole school topics e.g. Fractions, are kept in the maths cupboard. Teacher's reference books and research documents are kept in the staff room, on staff shared and the VLE.

Marking, Assessment and Record Keeping

Teachers assess learners through both formative and summative assessments. Ongoing observations of individual or group discussions and assessments from pieces of work support this. Marking of maths books has been reduced to allow more focus on lesson design in response to children's needs (see marking policy). However it is essential that staff pick up and address any misconceptions/mistakes, either during or at the beginning of the next lesson. Thorough questioning should ensure children have clarified their thinking clearly. Planning for the next lesson should identify and address common misconceptions/mistakes made before moving on to the next step.

Pupils take termly tests, which teachers use alongside their teacher assessment. Half termly tests are taken from the 'White Rose' end of unit tests or are created by teachers to cover specific areas. 'White Rose' end of term assessments are used in Autumn and Spring Term 2, whilst AQA papers are used for end of year testing. Children are assessed against the end of Year expectations outlined for each year group in the National Curriculum. However, it is an ongoing process throughout the whole year.

'Target tracker' is used to record pupil progress and to determine gaps in their learning and areas where further support or consolidation might be needed.

Parents are informed of children's progress in mathematics through:

1. Informal discussions
2. Parental consultations
3. Annual reports

Monitoring and Review

The subject leader monitors the planning of each group and supports colleagues in the teaching of mathematics. She provides a strategic lead and direction for the subject in the school. Whole school targets for the teaching of the subject are outlined in the School Development Plan, which is drawn up each year and monitored by the subject leader, the Middle and Senior Leadership team and Governors. Learning walks, lesson observations, planning scrutinies and book looks take place throughout the year to ensure consistency of teaching and learning across the school. The Curriculum Committee of the school's governing body monitors the teaching and learning of mathematics within the school and a report to this committee is given once a year.

Reviewed: June 2018

Next Review: June 2021

Appendix 1: Yearly Objectives

Year 3 Yearly Objectives

Number	Addition & Subtraction	Multiplication & Division	Fractions	Measures	Geometry	Statistics
I can count from 0 in multiples of 4 and 8.	I can add and subtract numbers mentally (3-digit number & ones).	I can recall and use \times and \div facts for the 3 times table.	I can count up and down in tenths.	I can measure, compare, add and subtract lengths (m/cm/mm).	I can draw 2-D shapes.	I can interpret and present data using bar charts.
I can count from 0 in multiples of 50 and 100.	I can add and subtract numbers mentally (3-digit number & tens).	I can recall and use \times and \div facts for the 4 times table.	I know that tenths arise from dividing an object into 10 equal parts.	I can measure, compare, add and subtract mass (kg/g).	I can make 3-D shapes using modelling materials.	I can interpret and present data using pictograms.
I can find 10 or 100 more or less of any given number.	I can add and subtract numbers mentally (3-digit number & hundreds).	I can recall and use \times and \div facts for the 8 times table.	I can recognise, find and write fractions for a set of objects.	I can measure, compare, add and subtract volume/capacity (l/ml)	I can recognise and describe 3-D shapes in different orientations.	I can interpret and present data using tables.
I can recognise the place value of each digit in a 3-digit number.	I can add numbers with up to 3-digits using a written method.	I can calculate mathematical statements for \times and \div facts I know.	I can recognise and use fractions as numbers. $\frac{1}{4} + \frac{3}{4} = 1$	I can measure the perimeter of simple 2-D shapes.	I can recognise angles as a property of shapes and turning.	I can solve one step problems such as 'How many more?'
I can compare and order numbers up to 1000.	I can subtract numbers with up to 3-digits using a written method.	I can use mental strategies to multiply a 2-digit and 1-digit number.	I can recognise and show, using diagrams, equivalent fractions.	I can + and - amounts of money to give change using £ and p.	I can identify right angles.	I can solve 2 step problems such as 'How many more?' 'How many fewer?'
I can identify, represent and estimate numbers in different contexts.	I can estimate the answer to a calculation and use inverse to check.	I can use efficient written methods to times a 2-digit and 1-digit number.	I can add and subtract fractions with the same denominator.	I can tell and write the time from an analogue clock and 24hr clock.	I know that 2 right angles make a half turn, 3 make $\frac{3}{4}$ and 4 make a full.	I can use simple scales (e.g. 2,5,10 units per cm) in pictograms.
I can read and write numbers to at least 1000 in numerals and	I can solve word problems for addition and subtraction.	I can solve problems using multiplication and division.	I can compare and order fractions with the same denominator.	I can recognise and write the Roman numerals from I to XII.	I can say if angles are greater than or less than a right angle.	I can interpret data presented in many contexts.

words.						
I can solve number problems and practical problems.	I can solve missing number problems for addition and subtraction.	I can solve missing number problems using multiplication and division.	I can solve problems that involve fractions.	I know the number of seconds in a min, and the days in a month and year.	I can identify horizontal, vertical, perpendicular & parallel lines.	
				I can compare durations of events.		

Year 4 Yearly Objectives

Number	Addition & Subtraction	Multiplication & Division	Fractions	Measures	Geometry	Statistics
I can count in multiples of 6, 7, 9, 25 and 1000.	I can add numbers with up to 4 digits using written methods.	I can recall \times and \div facts for multiplication tables up to 12×12 .	I can count up and down in 100ths and recognise how 100ths arise.	I can convert between different units of measure (e.g. km to m)	I can compare & classify geometric shapes based on properties & size.	I can interpret and present data using bar charts.
I can find 100 more or less than a given number.	I can subtract numbers with up to 4 digits using written methods.	I can use place value, known and derived facts to multiply mentally.	I can identify, name and write equivalent fractions of a given fractions.	I can measure and calculate the perimeter of a rectilinear figure in cm and m.	I can identify acute and obtuse angles.	I can interpret and present data using line graphs.
I can count backwards through zero to include negative numbers.	I can estimate to check answers to calculations.	I can use place value, known and derived facts to divide mentally.	I can add and subtract fractions with the same denominator.	I can find the area of rectilinear shapes by counting squares.	I can compare and order angles up to 2 right angles by size.	I can solve 'sum' problems using information presented in charts.
I can recognise the place value of each digit in a 4-digit number.	I can use inverses to check answers to calculations.	I can multiply 3 numbers together.	I can recognise and write decimal equivalents of any number of 10ths or 100ths.	I can estimate, compare & calculate different measures including £ and p.	I can identify lines of symmetry in 2-D shapes in different orientations.	I can solve 'comparison' problems using information presented in charts.

I can order and compare numbers beyond 1000.	I can solve addition 2-step problems, deciding methods to use.	I can recognise and use factor pairs in mental calculations.	I can recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.	I can read, write and convert time between analogue and digital clocks.	I can complete a simple symmetric figure.	I can solve 'difference' problems using information presented in charts.
I can identify, represent and estimate numbers.	I can solve subtraction 2-step problems, deciding methods to use.	I can multiply 2-digit numbers by a 1-digit number.	I can find the effect of dividing a number by 10 & 100 and identify the value of the digits in the answer.	I can solve problems, converting hrs to mins, mins to secs, years to months and weeks to days.	I can describe position on a 2-D grid as co-ordinates in the first quadrant.	I use a range of scales when interpreting and presenting data.
I can round any number to the nearest 10, 100 or 1000.	I can solve mental calculations with increasingly large numbers.	I can multiply 3-digit numbers by a 1-digit number.	I can round decimals with 1 decimal place to the nearest whole number.		I can translate shapes.	
I can solve number and practical problems using place value.		I can solve problems involving multiplying and dividing.	I can compare numbers with the same number of decimal places.		I can plot points and draw sides to complete a polygon.	
I can read Roman numerals to 100 and understand how numerals changed.			I can solve simple measure and money problems involving fractions & decimals.			

Year 5 Yearly Objectives

Number	Addition & Subtraction	Multiplication & Division	Fractions	Measures	Geometry	Statistics
I can read, write, order and compare numbers to at least 1,000,000.	I can add numbers with more than 4 digits using written methods.	I can identify multiples and factors, including finding all factor pairs.	I can compare and order fractions whose denominators are all multiples of the same number.	I can convert between different units of measure e.g. Km to m.	I can identify 3-D shapes, including cuboids from 2-D presentations.	I can solve 'comparison' problems using information in line graphs.

I know what each digit represents in numbers to 1,000,000.	I can subtract numbers with more than 4 digits using written methods.	I can solve problems using multiplication and division.	I recognise mixed numbers and improper fractions and convert from one form to another.	I can estimate the area of irregular shapes.	I know angles are measured in degrees and can estimate and measure them.	I can solve 'sum' problems using info from line graphs.
I can count in steps of powers of 10 for any given number up to 1,000,000.	I can add mentally, using increasingly large numbers.	I know and use the vocab of prime numbers, prime factors and composite (nonprime) numbers.	I can multiply proper fractions and mixed numbers by whole numbers, supported by materials & diagrams.	I understand & use basic equivalence between metric & imperial units.	I can identify angles at a point on a straight line and $1/2$ a turn.	I can solve 'difference' problems using information from line graphs.
I can use negative numbers in context & can count through 0 with positive and negative numbers.	I can subtract mentally, using increasingly large numbers.	I can establish whether a number up to 100 is prime & recall prime numbers up to 19.	I can + and - fractions with the same denominator & related fractions.	I can measure & calculate the perimeter of composite rectilinear shapes in cm and m.	I can draw a given angle, writing its size in degrees.	I can complete information in tables including timetables.
I can round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 & 100,000.	I can use rounding to check answers to calculations.	I can x numbers up to 4 digits by a 1 digit number using a written method.	I can read and write decimal numbers as fractions.	I can calculate and compare the area of squares and rectangles.	I can identify angles at a point and one whole turn.	I can read and interpret information in tables including timetables.
I can solve number problems and practical problems.	I can solve addition multi-step problems, deciding what operations & methods to use & why.	I can divide numbers up to 4 digits by a 1 digit number using a written method.	I can recognise and use 1000ths and relate them to 10ths, 100ths and decimal equivalents.	I can recognise and estimate volume and capacity.	I can identify reflex angles.	I can present information using ICT.
I can read Roman numbers to 1000 (M).		I can x and \div whole numbers and decimals by 10, 100 and 1000.	I can round decimals with 2 decimal places to the nearest whole	I can solve problems involving converting between units of	I can compare different angles.	

			number & to one decimal place.	time.		
I can recognise years written in Roman numerals.		I can recognise and use square numbers and cube numbers.	I can read, write, order and compare numbers with up to 3 decimal places.	I can solve problems involving + and – of units of measures with decimal notation.	I can draw shapes using given dimensions and angles.	
		I can solve problems including scaling by simple fractions and simple rates.	I can solve number problems up to 3 decimal places.		I can state and use the properties of a rectangle to deduce related facts.	
			I recognise the % symbol and can write percentages as a fraction.		I can distinguish between regular and irregular polygons.	

Year 6 Yearly Objectives

Number (Algebra)	Addition, Subtraction, Multiplication & Division	Ratio & Proportion	Fractions, Decimals & Percentages	Measures	Geometry	Statistics
I can read, write, order and compare numbers up to 10,000,000.	I can multiply multi-digit numbers up to 4 digits by a 2-digit whole number using a written method.	I can use common factors to simplify fractions & use common multiples to express fractions in the same denomination.	I can identify the value of each digit to three decimal places.	I can solve problems involving the calculation & conversion of units of measure, using decimal notation to 3 decimal places when needed.	I can recognise, describe and build simple 3-D shapes, including making nets.	I can interpret pie charts.
I can round any whole number.	I can divide numbers up to 4 digits by a 2-digit whole number using a written method.	I can compare and order fractions, including fractions > 1.	I can multiply and divide numbers by 10, 100 & 1000 where the answers are up to 3 decimal places.	I can read, write & convert between standard units of measure.	I can compare & classify geometric shapes based on their properties & size.	I can construct pie charts.

I can use negative numbers in context.	I can interpret remainders as whole number remainders, fractions or by rounding.	I can associate a fraction with division to calculate decimal fraction equivalents (0.375) for a simple fraction (3/8).	I can multiply 1-digit numbers with up to 2 decimal places by a whole number.	I can convert between miles and kilometres.	I can find unknown angles in any triangles, quadrilaterals & regular polygons.	I can interpret line graphs.
I can calculate intervals across '0' when using negative numbers.	I can calculate mentally, including with mixed operations and large numbers.	I can add & subtract fractions with different denominations & mixed numbers, by using equivalent fractions.	I can use written division methods in cases where the answer has up to 2 decimal places.	I can recognise that shapes with the same areas can have different perimeters and vice versa.	I can illustrate and name parts of circles, including radius, diameter and circumference	I can construct line graphs.
I can solve number problems and practical problems.	I can identify common factors, multiples and prime numbers.	I can multiply simple proper fractions, writing the answer in its simplest form (e.g. $1/4 \times 1/2 = 1/8$).	I can solve problems which require answers to be rounded to specified degrees of accuracy.	I can calculate the area of parallelograms and triangles.	I can find unknown angles where they meet at a point are on a straight line & are vertically opposite.	I can calculate and interpret the mean as well as average.
I can recognise years written in Roman numerals and read to 1000 (M).	I use knowledge of the order of operations to carry out calculations involving the 4 operations.	I can divide proper fractions by whole numbers (e.g. $1/3 \div 2 = 1/6$).	I can solve problems involving the calculation of percentages of whole numbers, such as 15% of 360.	I recognise when it is necessary to use the formulae for area & volume of shapes.	I can describe positions on the full co-ordinate grid (all 4 quadrants).	I can draw graphs relating to two variables.
I can express missing number problems algebraically.	I can solve addition and subtraction multi-step problems.	I can solve ratio & proportion problems involving the relative sizes of 2 quantities including similarity.	I can recall and use equivalences between simple fractions, decimals and percentages.	I can calculate estimate & compare volume of cubes & cuboids using cm cubed & cubic m.	I can draw and translate simple shapes & reflect them in the axes	I can convert kilometres into miles using a graphical representation.
I can generate and describe linear number sequences.	I can solve problems involving any operation.	I can solve ratio and proportion problems involving unequal sharing and grouping.				
I can use simple	I use estimation to					

formulae expressed in words.	check answers to calculations.					
I can find pairs of numbers that satisfy number sentences involving 2 unknowns.						

KIRFs 2019-2020

(key instant recall facts for maths)

End of KS1	Children should already have instant recall of multiplication and division facts for 2, 5 and 10 times tables Some will also be able to recall some number bonds to 20, double and halves to 20 and how to tell the time to the hour, half past and quarter to/quarter past. Assessment of these should take place at beginning of year 3 and practised if needed.			
	Year 3	Year 4	Year 5	Year 6
Autumn 1	I know number bonds for all numbers to 20.	I know number bonds to 100.	I know the multiplication and division facts for all times tables up to 12×12 .	I know the multiplication and division facts for all times tables up to 12×12 .
Autumn 2	I know the multiplication and division facts for the 3 times table.	I know the multiplication and division facts for the 6 times table.	I can recall square numbers up to 144 and their square roots.	I can identify prime numbers up to 50.
Spring 1	I know the multiplication and division facts for the 4 times table.	I can multiply and divide single-digit numbers by 10 and 100.	I can recall equivalent fractions of $1/5$, $1/3$ and $1/8$	I can identify common factors of a pair of numbers.
Spring 2	I know the multiplication and division facts for the 8 times table	I know the multiplication and division facts for the 9 and 11 times tables.	I can identify prime numbers up to 20. I can find factor pairs of a number.	I can convert between decimals, fractions and percentages.
Summer 1	I can tell the time and recall facts about durations of time.	I know the multiplication and division facts for the 7 times table.	I know decimal number bonds to 1 and 10.	
Summer 2	I know key facts about shape and measure.	I can recognise decimal equivalents of fractions: $1/2$, $1/4$, $1/10$ and $3/4$	I can recall metric conversions.	