Mathematics Primary Specification



The Rowan Learning Trust

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Trust Level

KS1 and KS2 specifications are central to planning for progress across each year group. KS1 & 2 children are formally assessed through DfE in the form of statutory assessments for English and Mathematics. Children receive a scaled score instead of a level. Their raw score – the actual number of marks they accrue – will be translated into a scaled score; this helps to allow for differences in the difficulty of the tests from year to year so that pupils' results can be compared accurately.

For KS1 children are matched against 'performance descriptors' (in other words what pupils are expected to know and be able to do at the time of testing) when being assessed by their teachers at the end of Key Stage 1 and 2 to see if they've achieved the expected standard.

At the end of KS2, SATs papers are marked externally, with no teacher assessment involved. Each child receives a raw score, a scaled score, and confirmation of whether or not they achieved the national standard. The range of scaled scores available for each KS2 test ranges from 80, the lowest possible scaled score, to 120, the highest possible scaled score.

A scaled score of 100 or more means that the child has met the expected standard in each KS2 SATs test; a scaled score of 99 or less means they haven't reached the government-expected standard.

As a trust we use these tests as well as commenting on whether your child has made good progress over the year from our own assessments, giving details of curriculum areas where they have achieved well and areas that need more development and support. For subjects other than English and Maths, our own assessments & judgements are made on progress and attainment.

Examples of **age-related expectations** are:

- Working within the expected level of attainment for his/her age
- Working towards the expected level of attainment
- Working below the expected level of attainment
- Working beyond the expected level of attainment (at greater depth)

Gradings are personalised based on each schools assessment tracking system.

Our specifications map stage descriptors up to Year 6 using progressive assessment objectives in line with National Curriculum. KS2 builds on essential skills and knowledge developed in previous years in preparation for moving forward in to KS3 and beyond. Skills and knowledge from the stage descriptors will inform teachers of student progress. This is turn will contribute to parents' evenings and end of year reports to parents.

School Level
Formal assessments may be administered in different ways depending on the school. E.g. gradings offered, end of unit mini assessments, knowledge review weeks, termly or half termly assessment periods etc.

In addition to formal assessments, schools will assess pupils informally in accordance with the schools guidelines. At school level the KS2 specification document for each subject will be supported by the school's own planning documents/ portals which also include LTPs, MTPs, Schemes of work and associated resources.

Long Term Plans provide leaders, teachers, students and parents with the overview of the learning journey that occurs yearly. These are available on the school website.

Medium Term Plans map the outline learning for each of the learning focusses of each half term in each year group. These provide more detailed information into the steps to facilitate a differentiated approach ensuring that content and skills are covered. The number of activities / objectives covered may vary dependent on the length of a half term and the frequency of lessons in a given subject. There are 5 planning cycles in the year. Autumn 1, Autumn 2, Spring, Summer 1 and Summer 2.

Schemes of Work may vary from subject to subject allowing the specialists in schools to develop suitable activities and topics ensuring ownership of planning for progress. Please note that no external schemes are followed to the book and when used, are merely a starting point for start.

SOW – Guiding Principles

- Skills and content based
- Form part of the 'big picture' e.g.show progression over the 6 years in school
- Provide suggested resources
- Allow for teacher ownership and/or creativity of lessons
- Allow for appropriate scaffolds

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It 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, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Mathematics within EYFS Early Years Foundation Stage (EYFS) pupils' mathematics skills vary on entry, based on their previous experiences. As children begin with us at Farington Primary School, we get to know our children and understand their background. Additionally, we conduct a mathematics baseline assessment to establish children's level of understanding of number. Our aim is for children to develop a positive attitude to maths, display genuine and deep understanding by exploring concepts using concrete and pictorial approaches; articulate and represent reasoning using the language of mathematics; be skilled problems solvers, consciously applying a range of logical and systematic strategies; show rapid recall of number facts rooted in secure understanding; show resilience, perseverance and independent thought; and make links and connections across mathematical domains and apply skills throughout the wider curriculum.

In EYFS, children are given the opportunity to develop their understanding of number and pattern through a combination of short, formal teaching as well as a range of planned structured play situations where there is opportunity for exploration and discovery. Skilled practitioners enhance children's mathematical understanding through quality interactions and modelled language within continuous provision.

As soon as children begin with us at Farington Primary School they are introduced to regular daily routines, such as registration, snack time, lunch time and going-home time, and how to use numbers and mathematical vocabulary to describe things and/or events within the setting to then apply in a wider context independently; this is supported by a visual timetable. Additionally, children are encouraged to use numbers 'in context' by using numbers in practice, not just in theory, to deepen their understanding. Our continuous provision allows children to apply their knowledge, experiment, and test their new understanding by using numbers in real-life situations. We practice daily counting and subitising and we adopt a mastery approach to number so as children understand number within a variety of circumstances.

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including natural resources and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Number

At Farington Primary School, we follow First4Maths to support a progressive approach to teaching number, number patterns, shape, space and measure allowing teachers to adapt lessons based on the class. To build upon the suggested teaching, we implement the use of concrete resources and provide the opportunity for children to practise through the manipulation of objects. Once a concept has been secured through using

concrete resources, we introduce pictorial representations. In addition to daily counting, children practise subitising.

By the end of the children's Reception year we aim for children to:

- Gain a deep understanding of number to 10, including the composition of each number;

- Subitise (recognise quantities without counting) up to 5;

- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

When considering the provision for mathematics in our classroom, we regularly evaluate the effectiveness of opportunities we have created. The Early Years environment offers rich opportunities for children to be able to count, sort, arrange, make sets etc. whether this is through construction, transient art, creative area, or small world. There is a specific area for maths both indoors and outdoors, and each week a new 'Maths Challenge' is created as part of our provision focus. The focus of the challenge is always linked to the previous week's learning objective to encourage repetition and provide opportunity to further build on new knowledge. The indoor maths area is stocked with a variety of resources such as story books (with mathematical links and regularly updated), weighing scales, counting objects, tens frames, part part whole model templates, counting sticks, numerals, dice, Numicon, tape measures, rulers, and enhanced regularly to link with current learning. Our outdoor area is stocked with larger items such as a large tens frame, counting sticks, large dice, numbered skittles, number lines that can be manipulated, number tiles, and numerals. These areas are also equipped with recording tools such as chalkboards, whiteboards, and paper. Children are encouraged to attempt recording within mathematics and within their play or a range of instances, for example recording a friend's score in a skittle game or their time for completing an assault course, making price lists / tags, tallying, representing number in a variety of ways, measuring heights, and many more. Although there is a Maths specific area, we think about the concepts of mathematics that children need to develop in the Early Years and make them part of provision so as maths becomes integral to play and learning eg. add money, calendars, tills, clocks etc. to the home area, sorting opportunities within all areas, mathematical language displayed throughout the environment.

<u>Number Patterns</u>

By the end of the Reception year, children at the expected level of development will: - Verbally count beyond 20, recognising the pattern of the counting system; - compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

We promote pattern being central to maths and children have an instinctive idea of patterns. Research shows that children's ability to see patterns forms the basis of early mathematical thinking. When you teach children to become aware of patterns, they will build up the skill of spotting patterns for themselves, they will see how patterns change and notice irregularities.

Early patterning begins with matching one-to-one with objects, pictures or numbers, progressing to patterned material and small objects to arrange in patterns. We encourage children to talk about, and identify the patterns around them, so they can learn the words that describe different patterns. As children become more confident in making patterns and seeing connections, they will be able talk out loud about what they have

noticed and start to identify the mathematical relationships and connections around them in the home, our learning environment and outside in nature. Patterning supports the foundations for recall of the counting sequence and understanding number operations. Learning about patterns and connections will help children to make their own predictions and form logical connections. It's an important foundation for later mathematical thinking and reasoning.

Shape, Space and Measure

Although shape, space and measure no longer feature in the Early Learning Goals they are still represented in our curriculum and taught throughout the year. We believe they should still be part of the mathematical experiences on offer to our children and provides building blocks for success in mathematics. We enhance continuous provision to allow opportunities to develop shape, space and measure.

Story based links, Songs and Rhymes

When teaching mathematics, we often use stories and books to help further develop children's understanding. This helps to encourage children to make mathematical links to their own world.

We have found that children love listening to and taking part in stories and rhymes, and that they provide the opportunity to naturally introduce maths vocabulary through stories. Many rhymes can offer a range of ideas to promote interest and understanding in number, shape, measurement, patterns, mathematical language, counting, ordering, comparing, repeating patterns and problem-solving.

Each maths lesson begins with counting practise and may be followed by songs or rhymes. We sing well known rhymes such as 5 Green and Speckled Frogs, 5 Little Men in a Flying Saucer, 10 Green Bottles, 1 2 3 4 5 Once I caught a Fish Alive, 5 Current Buns. 5 Little Ducks. We also sing new songs around counting forwards and backwards from 20, subitising, doubling, number bonds to 5, and number bonds to 10. This is to help children with recall, mathematical storytelling, and problem solving.

Some texts explored in EYFS have explicit links, whereas to Mathematics and number, others are less obvious.

Learning Journal and Parent Communication

At Farington, each child has their own account on an online learning journal, which is safe and shared with parents / carers regularly throughout the year. Evidence of children achieving aspects within the Early Learning Goals are recorded with pictures and a short narrative making links to the children's areas of learning and characteristics of effective learning. Parents can also access the online journal to contact the class teacher and provide evidence of what children have achieved at home.

The national curriculum for mathematics aims to ensure that all pupils:

- 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
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- 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

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated reasoning and problem solving before any acceleration through new content. Children at all levels should be accessing reasoning and problem-solving challenges, the way this is accessed will be dependent upon their age and ability. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on. Children working at this level should focus on the 'Ready to Progress' statement areas (First4Maths) to ensure that foundational knowledge is secured. Occasionally, children who are working significantly below ARE will access a bespoke maths curriculum, focusing on developing skills based on their level of access.

See National Curriculum Mathematics programmes of study: key stages 1 and 2 for individual year group objectives.

MATHS INTENT

All children develop a sound understanding of all areas of Mathematics, through fun, enjoyable and interactive lessons. All pupils are encouraged to become independent and motivated mathematicians. Our progressive curriculum enables pupils to scaffold, support and challenge their own learning equipping them with valuable numeric, reasoning and problem-solving skills for life.

MATHS IMPLEMENTATION

In the Foundation Stage, children are given the opportunity to develop their understanding of number, measurement, pattern and shape and space through a combination of short, formal teaching as well as a range of planned structured play situations, where there is plenty of scope for exploration.

Teachers throughout school use the planning structure and overviews from First4Maths. Teachers adapt and make reasonable adjustments to the planning based on assessment feedback and the demands and needs of the class. They have the autonomy to use other resources ensuring that appropriate challenge and supportive scaffolds are used to allow our children to reach their full potential.

A progression towards efficient written calculations should be developed and applied consistently in each year-group. The school Mental to Written Calculation Policy should be closely followed.

Prior learning is completed before a new topic/concept is taught to inform teacher's planning for groups and individual pupils.

Assessment for learning should occur throughout the entire maths lesson, enabling teachers/teaching assistants to adapt their teaching/input to meet the children's needs. This feedback should be incisive and regular and, if further support and intervention is needed, this can be put in place early.

Though the nature of lessons will be very different depending on the needs of the class, children should be active; practising skills they haven't yet mastered (perhaps recapping on class targets/correcting errors from a previous lesson); learning something new or learning to apply their knowledge to different contexts. They should be: active very quickly; working at a good pace and being productive; sharing their thoughts and methods and being successful. They should move from concrete, to pictorial to abstract representations before applying their knowledge moving from fluency to reasoning and problem-solving challenges when appropriate.

Daily counting and mental strategies (number bonds, times tables facts and various strategies for calculation taught) are taught and practised weekly through morning tasks and mental maths lessons, these form our additional '15-minute Maths' element of the school day and are practised in addition to the daily Maths lessons.

All children should access fluency, reasoning and problem-solving activities on a weekly basis and should be encouraged at all times to communicate their understanding of maths so that it clarifies their thoughts.

Termly summative assessments should take place to provide further understanding of the level a child is working at and to inform a more rounded judgement of their abilities.

MATHS IMPACT

- Children use facile knowledge of number facts to support their learning and functionality in and outside of school.
- Children skilfully draw from a range of mental strategies to solve increasingly challenging calculations and problems.
- Children retain skills and knowledge and build on them progressively over time.
- Children have the opportunity to problem solve through decision making and reasoning in a range of contexts.
- Children explore features of shape and space and develop measuring skills to equip them with life skills.
- Children develop mathematical communication through speaking and listening, practical activities and recording work.
- Children practise and apply skills in the wider curriculum to ensure they are retained.

Summary of Subject Content

Early Years

Reception Curriculum Overview

Mathematics					
Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Cardinality & Counting 1.1 Accurate counting of sets of objects 1-5 NB S1 episodes 9 & 10 (1:1 correspondence, cardinality) 1.2 Subitising 1-3 NB S1 episodes 1-4 (Introducing 1, 2 and 3) 1.3 Numeral Recognition to 5 **Composition** 1.1 Conceptual subitising - noticing numbers within numbers **Comparison** 1.1 Compare sets 1-5 using vocab of more / fewer / most /fewest **Shape/Space** 1.1 2D shapes and their properties **Pattern** 1.1 Simple AB patterns (complete, copy, make own and spot/correct errors in patterns) A lot of this content should be a recap from Nursery and provide you with baseline assessment data	**Cardinality & Counting** 2.1 Accurate counting of sets of objects 1-10, recognising and ordering numerals 1-10 2.2 Subitising 1-5 NB S1 episodes 6 & 7 (Introducing 4 and 5) **Composition** 2.1 Applied conceptual subitising NB S1 episode 11 (Stampolines) 2.2 Inverse operations - splitting and recombining sets of objects 1-5 including on part whole model NB S1 episode 12 (Whole of me) **Comparison** 2.1 Compare numbers using vocab of more/less 2.2 Find 1 more using sets of objects on tens frames and on a number track **Pattern** 2.1 identifying unit of repeat – AB & ABC patterns	**Cardinality & Counting** 3.1 Counting backwards 10-1 & ordering numbers 10-1 **Composition** 3.1 Systematic approach to partitioning sets of objects 1-5 including on part whole model NB S1 episode 14 (Holes) **Comparison** 3.1 Find 1 less using sets of objects on tens frame and on a number track **Measures** 3.1 Height **Shape/Space** 3.1 Spatial vocabulary (in front, behind, in between, on, in, under, first second, third) **Pattern** 3.1 More complex patterns – ABB, ABBC 3.2 Generalising pattern and transferring to another format e.g. link pattern of shapes to movements	**Composition** 4.1 Recall number bonds for numbers 1-5 4.2 Partitioning and recombining sets of objects 6-9 Including on part whole model and tens frame NB S2 episodes 1-5 (Introducing 6-10) **Measures** 4.1 Length **Shape/Space** 4.1 Representing spatial relationships as maps Spatial vocabulary (forwards, backwards, up, down, across) **Pattern (alongside Comparison)** 4.1 Numerical Patterns – staircase patterns linked to finding 1 more/1 less using a mental numberline (Comparison) NB S2 episodes 6 & 7 (Just add one & ten green bottles)	**Cardinality & Counting** 5.1 Counting beyond 10 noticing pattern in ones **Composition** 5.1 Systematic approach to splitting and recombining 10 including on tens frame and part whole model 5.2 recall some number bonds for 10 NB S2 Episode 13 (Blast Off!) **Measures** 5.1 Mass **Shape/Space** 5.1 3D shapes properties of shapes **Patterns** 5.1 Numerical patterns odds & evens NB S2 episode 11 (Odds & Evens)	**Cardinality & Counting** 6.1 Counting beyond 20 noticing pattern in tens **Measures** 6.1 Capacity 6.2 Time – sequence of events **Shape/Space** 6.1 Relationships between shapes **Pattern (alongside Composition & Comparison)** 6.1 Symmetry/reflections – link to doubles 6.2 Share fairly (comparison), Use part whole model to partition numbers where both parts are the same (Composition) and Look at halving as inverse of doubles (Pattern) NB S2 episode 9 (Double Trouble) Possible extension Sharing between more than two (comparison) NB S2 episode 8 (Counting Sheep) Splitting into more than 2 parts on a part whole model (composition) NB S2 episode 10 (The three threes)

At Farington Primary School, First4Maths planning overviews are followed and used as our short, medium and long term planning. The First4Maths Intent documents show progression of learning throughout the year. Planning is supplemented and adapted by the class teacher to best ensure the needs are met of their class.

The maths curriculum is taught in the following order for each year group:

Year 1 – Mathematics Intent

Block	Topic
1	Number and Place Value to 10
2	Addition and Subtraction to 10
3	Number and Place Value to 20
4	Addition and Subtraction to 20
5	Geometry Shape
6	Fractions
7	Geometry Position & Direction
8	Measures – Time
9	Number and Place Value beyond 20
10	Multiplication and Division
11	Measures - Money
12	Measures – Length, Mass and Capacity

Year 2 – Mathematics Intent

Block	Topic
1	Number and Place Value
2	Addition and Subtraction
3	Money
4	Multiplication and Division
5	Fractions
6	Geometry – Properties of Shape
7	Measures – Time
8	Statistics
9	Geometry – Position & Direction
10	Measures – Length, Height, Mass, Capacity and Temperature

Year 3 – Mathematics Intent

Block	Topic
1	Number and Place Value
2	Addition and Subtraction
3	Multiplication and Division
4	Money
5	Fractions and Decimals
6	Geometry
7	Statistics
8	Measures – Time
9	Measure – Length and Perimeter
10	Measures – Mass and Capacity

Year 4 – Mathematics Intent

Block	Topic
1	Number and Place Value
2	Addition and Subtraction
3	Multiplication and Division
4	Fractions
5	Decimals and Money
6	Geometry
7	Statistics
8	Measures – Time
9	Measures – Length, Perimeter & Area, Mass and Capacity

Year 5 – Mathematics Intent

Block	Topic
1	Number and Place Value
2	Addition and Subtraction
3	Multiplication and Division
4	Fractions
5	Decimals & Percentages
6	Geometry
7	Measures – Length, Mass and Capacity
8	Measure – Perimeter and Area
9	Measure - Time
10	Statistics

Year 6 – Mathematics Intent

Block	Topic
1	Number and Place Value
2	Addition and Subtraction
3	Multiplication and Division
4	Fractions
5	Decimals and Percentages
6	Ratio and Proportion
7	Geometry – Shape, Position and Direction
8	Measure
9	Statistics
10	Algebra
11	Number, Geometry, Substantial Problem Solving

STAGE DESCRIPTOR EYFS	
EYFS	Mathematics is not just about getting answers, but communicationg ideas. Pupils are nurtured and develop positive attitudes towards mathematics by seeking it out in the environment and demonstrating a willingness to 'Have a Go.' In Reception, Cardinality and Counting is a fundamental starting point: a numerosity and "howmanyness" approach. Conservation of number is a priority and is a prerequisite to work with Composition. Our children must be able to count and subitise first: • Count objects, actions and sounds. • Subitise. • Link the number symbol (numeral) with its cardinal number value • Count beyond ten. • Compare numbers • Understand the 'one more than/one less than' relationship between consecutive numbers. • Explore the composition of numbers to 10. • Automatically recall number bonds up to 5 and some bonds to 10, including doubling facts – without referencing rhymes, counting or other aids) • Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. • Continue, copy and create repeating patterns. • Compare length, weight and capacity • Verbally count beyond 20, recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other Quantity`. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally

STAGE DESCRIPTORS KS1 & 2	
YEAR 1	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 multiples of twos, fives and tens • given a number, identify one more and one less • identify and represent numbers using 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 numerals and words. Addition and Subtraction • read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9. Multiplication and Division • solve one-step problems involving multiplication and division, by 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. Measurement • compare, describe and solve practical problems for: 1. lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] 2. mass/weight [for example, heavy/light, heavier than, lighter than] 3. capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] 4. time [for example, quicker, slower, earlier, later] • measure and begin to record the following: 1. lengths and heights 2. mass/weight 3. capacity and volume 4. time (hours, minutes, seconds) • recognise and know the value of different denominations of coins and notes • sequence events in chronological order using language [for example, 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 – Position of Shapes • recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] and 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. Geometry – Position and Direction

	• describe position, direction and movement, including whole, half, quarter and three quarter turns.
YEAR 2	Number and Place Value • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and 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 problems with addition and subtraction: 1. using concrete objects and pictorial representations, including those involving numbers, quantities and measures 2. 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: 1. a two-digit number and ones 2. a two-digit number and tens 3. two two-digit numbers 4. adding three one-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 solve 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 • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve 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 and write fractions 1/3, ½, 2/4 and 3/4 of a length, shape, set of objects or quantity • write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2. Measurement

	• 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 = • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • 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 • know the number of minutes in an hour and the number of hours in a day. Geometry – Properties of Shape • identify and describe the properties of 2-D shapes, including the number of sides and line 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, [for example, 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 and Direction • order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). Statistics • 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 comparing categorical data.
YEAR 3	Number and Place Value • count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas. Addition and Subtraction • add and subtract numbers mentally, including: 1. a three-digit number and ones 2. a three-digit number and tens 3. a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. Multiplication and Division

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Fractions

- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7]
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

Measurement

- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- measure the perimeter of simple 2-D shapes
- add and subtract amounts of money to give change, using both £ and p in practical contexts
- tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight
- know the number of seconds in a minute and the number of days in each month, year and leap year
- compare durations of events [for example to calculate the time taken by particular events or tasks].

Geometry – Properties of Shape

- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Statistics

- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

YEAR 4	Number and Place Value • count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. Addition and Subtraction • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. Multiplication and Division • recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. Fractions (including decimals) • recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to ¼, ½, 3/4 • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places. Measurement • Convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares

	• estimate, compare and calculate different measures, including money in pounds and pence read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. Geometry – Properties of Shape • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry. Geometry – Position and Direction • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon. Statistics • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
YEAR 5	Number and Place Value • read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1000 (M) and recognise years written in Roman numerals. Addition and Subtraction • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. Multiplication and Division • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

- recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Fractions (including decimals and percentages)

- compare and order fractions whose denominators are all multiples of the same number
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5]
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example, 0.71 = 71/100]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places
- solve problems involving number up to three decimal places
- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
- solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

Measurement

- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Geometry – Properties of Shape

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees (^{o})

	• identify: 1. angles at a point and one whole turn (total 360°) 2. angles at a point on a straight line and 2 1 a turn (total 180°) 3. other multiples of 90° • use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Geometry – Position and Direction • identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. Statistics • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables
YEAR 6	Number and Place Value • read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • round any whole number to a required degree of accuracy • use negative numbers in context, and calculate intervals across zero • solve number and practical problems that involve all of the above. Addition, Subtraction, Multiplication and Division • multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • perform mental calculations, including with mixed operations and large numbers • identify common factors, common multiples and prime numbers • use their knowledge of the order of operations to carry out calculations involving the four operations • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Fractions (including decimals and percentages) • use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 × 1/2 = 1/8] • divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] • identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • multiply one-digit numbers with up to two decimal places by whole numbers

	• use written division methods in cases where the answer has up to two decimal places • solve problems which require answers to be rounded to specified degrees of accuracy • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Ratio and Proportion • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Algebra • use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables. Measurement • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]. Geometry – Properties of Shape • draw 2-D shapes using given dimensions and angles • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. Geometry – Position and Direction • describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes. Statistics • interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average.

Formal Assessment

1. In Reception, children are assessed against the Early Learning Goals for Mathematics that forms part of the Foundation Stage Profile.
2. Bi-weekly mental arithmetic assessments are completed and used to inform bi-weekly teaching points based on outcomes (relating to previously taught content of the curriculum).
3. Arithmetic and Reasoning assessments using formal test papers each term.
4. Termly pupil progress meetings to agree pupil gradings and plan targeted support.
5. Assessment grades on school tracking system for Autumn, Spring and Summer – as monitored by Maths subject leader, SLT and Primary Director within the Trust..
6. Moderation by Maths subject leader, termly.

The below gradings are assigned three times a year.

- The child is working significantly below key stage expectations**. (PKS)**
- The child has not met/retained the year group objectives but is working towards these. **(WTS)**
- The child has met/retained the objectives. **(EXP)**
- The child has met the objectives with a large degree of independence - As well as meeting the objectives independently, they will also display other subject-specific qualities which contribute to their assessment if awarded GDS. **(GDS)**

Assessment Criteria

Based on formative assessments grading guidance is as follows. Teacher discretion is always advised when finalising judgements.

	EXP	GDS
Autumn	45%	65%
Spring	55%	75%
Summer	65%	85%


The Rowan
Learning Trust

Our logo was carefully chosen to represent the children, young people and adults in our learning community who strive for excellence through high aspiration and high expectation.



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