Finstall First School

Mathematics Policy
June 2020

We care, we share, we learn and achieve

Contents

Curriculum Rationale for Mathematics

Curriculum Intent

To enable all children to achieve and attain well in Maths through effective delivery of the objectives laid out in the National Curriculum for Mathematics (2014). This will ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, 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, exploring relationships and making generalisations, and developing arguments, justification or proof using mathematical language
- can **solve problems** by applying their mathematical skills 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 ensure that skills and knowledge acquired in Mathematics can be applied in other areas of the curriculum.

To ensure that children understand the term Mathematics and the vocabulary associated with different areas of Mathematics.

To prepare children for life by helping them become more independent, organised, confident and resilient; to be good communicators, creative and able to solve problems and to be appreciative and reflective.

Curriculum Implementation

Provide regular opportunities for the children to re-cap their prior learning to ensure that key skills, knowledge and concepts are embedded in their long-term memory.

To ensure that the curriculum is enriched by carrying out purposeful, relevant, inspiring and interesting lessons and developing a love of Mathematics at home as well as at school.

- Children receive a daily lesson involving snappy, mental sessions to develop children's ability to calculate mentally. These sessions are used to revise concepts taught previously in the year and to practice multiplication tables. Children also learn through direct, interactive teaching and through their own independent work. The lessons are lively, active and stimulating and participation features strongly. Practical resources are used to support and deepen children's understanding of key knowledge and skills and to develop perseverance and resilience.

A cyclical approach to teaching and learning ensures that children revisit key skills and deepen/extend their understanding in the different areas of the Maths curriculum.

The curriculum is delivered by adults who have a strong, caring relationship with the pupils they teach and they have a strong subject knowledge.

Curriculum Impact

To ensure that there are high quality outcomes in Mathematics in all year groups where children know more, remember more and can do more.

The children acquire skills that are developed through their years in the school so that they become confident, resilient and independent Mathematicians who enjoy the subject and continue to do well in the next stage of their education.

The above can be evidenced in the children's performance in statutory assessments and in the end of year Teacher Assessments carried out in year groups where statutory assessments do not exist. It can also be evidenced from Lesson observations carried out by the Subject Leader and members of the SLT, from looking at children's books and from talking to pupils about their work.

Use of technology.

Lessons are enhanced by the use of a range of technology, wherever possible, in order to maximise learning and understanding. A wide range of programmes and equipment are regularly used.

Calculators are not a substitute for good written and mental arithmetic. Therefore, they are not generally used at Finstall First School. We believe that calculators should only be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems and only if written and mental arithmetic are secure. Teachers should use their professional judgement about when such tools are needed.

Spoken language

The National Curriculum for Mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof.

They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

School Curriculum

The programmes of study for Mathematics are set out year-by-year for key stages 1 and 2 within the National Curriculum.

Attainment Targets

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.

The Foundation Stage: What do we teach at Finstall First School?

Mathematics in the Foundation Stage follows the objectives set out in the Foundation Stage Profile, which underpin the curriculum planning for children aged three to five. We give all the children ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics.

In Foundation Stage, children's mathematical development is also carefully planned-for, through adult-led focused activities and through child-initiated activities.

Throughout Foundation Stage, children are encouraged to use and develop mathematics through play in all areas of provision. Mathematical resources such as large number lines, different sized objects, sorting trays and pegs for developing patterns are readily available. Concepts of shape, space, direction, size, length, capacity and mass are developed through sand, water and tactile play, outdoor provision, small world play, storytelling and nursery rhymes for example.

Assessment in Foundation Stage is ongoing and each child's 'Learning Journey' is updated weekly whereas the 'Foundation Stage Profile' is updated at the end of each half term. Mathematics is reported on at the end of each year to parents.

Key Stage 1 – Years 1 and 2: What do we teach at Finstall First School?

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 (this includes bonds for numbers up to 20. E.g. 1 and 10 makes 11; 2 and 9 makes 11) and be precise in using and understanding place value. They should also be confident when counting in steps of 2, 5 and 10.

An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage.

Lower Key Stage 2 – Years 3 and 4: What do we teach at Finstall First School?

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 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 be able to recall their multiplication tables to 12 x 12 and know their corresponding division facts. They will be tested on these in an Online Multiplication Test, known as the MTC.

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

The National Curriculum for Mathematics is organised according to typical age-related expectations. 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.

Upper Key Stage 2 – Years 5 and 6

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 four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
Pupils should read, spell and pronounce mathematical vocabulary correctly.

Year 1

Year 1 - Statutory requirements: number and place value

Pupils are taught to:

- 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.

Year 1 - Statutory requirements: addition and subtraction

Pupils are taught to:

- 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.

Year 1 - Statutory requirements: multiplication and division

Pupils are taught to:

- 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.

Year 1 - Statutory requirements: fractions

Pupils are taught to:

- 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.

Year 1 - Statutory requirements: measurement

Pupils are taught to:

- Compare, describe and solve practical problems for:
  - Lengths and heights [for example, long/short, longer/shorter, tall/short, double/half].
  - Mass/weight [for example, heavy/light, heavier than, lighter than].
  - Capacity and volume [for example, full/empty, more than, less than, half, half full, quarter].

- o Time [for example, quicker, slower, earlier, later].

- Measure and begin to record the following:
  - o Lengths and heights
  - o Mass/weight
  - o Capacity and volume
  - o 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.

Year 1 - Statutory requirements: geometry - properties of shape

Pupils are taught to:

- Recognise and name common 2-D and 3-D shapes, including:
  - o 2-D shapes [for example, rectangles (including squares), circles and triangles]
  - o 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].

Year 1 - Statutory requirements: geometry position and direction

Pupils are taught to:

- Describe position, direction and movement, including whole, half, quarter and three-quarter turns.

Year 2

Year 2 - Statutory requirements: number and place value

Pupils are taught to:

- 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.

Year 2 - Statutory requirements: addition and subtraction

Pupils are taught to:

- Solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures.
- applying their increasing knowledge of mental and written methods recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - A two-digit number and ones
  - A two-digit number and tens
  - Two, two-digit numbers
  - 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.

Year 2 - Statutory requirements: multiplication and division

Pupils are taught to:

- 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 ($\times$), division ($\div$) 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.

Year 2 - Statutory requirements: fractions

Pupils are taught to:

- Recognise, find, name and write fractions ⅓, ¼, 2/4, ¾ of a length, shape, set of objects or quantity.
- Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½.

Year 2 - Statutory requirements: measurement

Pupils are taught to:

- 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.

Year 2 - Statutory requirements: geometry - properties of shape

Pupils are taught to:

- 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.

Year 2 - Statutory requirements: geometry position and direction

Pupils are taught to:

- 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 anti-clockwise).

Year 2 - Statutory requirements: statistics

Pupils are taught to:

- 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

Year 3 - Statutory requirements: Number – number and place value

Pupils are taught to:

- 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.

Year 3 - Statutory requirements – addition and subtraction

Pupils are taught to:

- Add and subtract numbers mentally, including:
  - A three-digit number and ones.
  - A three-digit number and tens.
  - A three-digit number and hundreds.
- Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.
- Estimate the answer to a calculation and use inverse operations to check answers.
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Year 3 - Statutory requirements: multiplication and division

Pupils are taught to:

- Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 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.

Year 3 - Statutory requirements: fractions

Pupils are taught to:

- 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.

Year 3 - Statutory requirements: measurement

Pupils are taught to:

- 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].

Year 3 - Statutory requirements: geometry - properties of shape

Pupils are taught to:

- 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 make 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.

Year 3 - Statutory requirements: statistics

Pupils are taught to:

- 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

Year 4 - Statutory requirements: number and place value

Pupils are taught to:

- 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.

Year 4 - Statutory requirements: addition and subtraction

Pupils are taught to:

- 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.

Year 4 - Statutory requirements: multiplication and division

Pupils are taught to:

- 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.

Year 4 - Statutory requirements: fractions and decimals

Pupils are taught to:

- 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 ½, 1/4/ ¾
- 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.

Year 4 - Statutory requirements: measurements

Pupils are taught to:

- 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.

Year 4 - Statutory requirements: geometry - properties of shape

Pupils are taught to:

- 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.

Year 4 - Statutory requirements: geometry position and direction

Pupils are taught to:

- 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.

Year 4 - Statutory requirements: statistics

Pupils are taught to:

- 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

Year 5 - Statutory requirements: number and place value

Pupils are taught to:

- 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.

Year 5 - Statutory requirements: addition and subtraction

Pupils are taught to:

- 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.

Year 5 - Statutory requirements: multiplication and division

Pupils are taught to:

- 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 (non-prime) 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.

Year 5 - Statutory requirements: fractions including decimals and percentages

Pupils are taught to:

- 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 1/2 , $\frac{1}{4}$, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

Year 5 - Statutory requirements: measurement

Pupils are taught to:

- 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.

Year 5 - Statutory requirements: geometry – properties of shape

Pupils are taught to:

- 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: angles at a point and one whole turn (total 360°), angles at a point on a straight line and ½ a turn (total 180°); 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.

Year 5 - Statutory requirements: geometry – position and direction

Pupils are taught to:

- 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.

Year 5 - Statutory requirements: statistics

Pupils are taught to:

- Solve comparison, sum and difference problems using information presented in a line graph.
- Complete, read and interpret information in tables, including timetables.

Year 6

Year 6 - Statutory requirements: number and place value

Pupils are taught to:

- 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.

Year 6 - Statutory requirements: addition, subtraction, multiplication and division

Pupils are taught to:

- 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.

Year 6 - Statutory requirements: fractions including decimals and percentages

Pupils are taught to:

- 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, $\frac{1}{4} \times \frac{1}{2} = 1/8$].
- Divide proper fractions by whole numbers [for example, $1/3 \div 2 = 1/6$.
- 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.

Year 6 - Statutory requirements: ratio and proportion

Pupils are taught to:

- 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.

Year 6 - Statutory requirements: algebra

Pupils are taught to:
- 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.

Year 6 - Statutory requirements: measurement

Pupils are taught to:

- 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].

Year 6 - Statutory requirements: geometry – properties of shape

Pupils are taught to:

- 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.

Year 6 - Statutory requirements: geometry – position and direction

Pupils are taught to:

- 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.

Year 6 - Statutory requirements: statistics

Pupils are taught to:

- Interpret and construct pie charts and line graphs and use these to solve problems
- Calculate and interpret the mean as an average.

Planning

Mathematics is a core subject in the National Curriculum. Teachers draw upon excellent subject knowledge, planning astutely, setting challenging tasks based on systematic, accurate assessment of pupils' prior skills, knowledge and understanding. They use well-judged and often imaginative teaching strategies to engage and inspire learners at Finstall First School.

Using and applying mathematics is integrated into planning and teaching. This has been developed from the use of the 'block' and 'unit' approach to planning, as outlined in the Primary Framework and amended in line with the revised National Curriculum 2014 for Mathematics.

Progression of calculation

We have a policy for progression in calculation to ensure continuity and consistency throughout the school. (See Calculation Policy). The Calculation Policy has been devised to meet the requirements of the National Curriculum 2014 for the teaching and learning of Mathematics and has been agreed and also adopted by the following schools within the Bromsgrove Pyramid – Aston Fields Middle School, Hanbury First School, Stoke Prior First School and Charford First School.

Differentiation and support, including support for SEN.

At Finstall First School we aim to provide a broad and balanced education to all pupils. Effective tracking enables identification of pupils who may benefit from early intervention at an appropriate level.

Differentiation is incorporated into all mathematics lessons and is done in various ways, for all pupils including those who are lower and higher achieving:

- Setting appropriately challenging tasks based on systematic, accurate assessment of pupils' prior skills, knowledge and understanding.
- Timely support and intervention; systematically and effectively checking pupils' understanding throughout lessons.
- Ensuring that marking and constructive feedback is frequent and of a consistently high quality enabling pupils to understand how to improve their work; children must be given time to respond to feedback.
- Open ended activities/investigations where differentiation is by outcome.
- Providing a variety of resources depending on abilities e.g: Counters, cubes, 100 squares, number lines, mirrors.
- Support from teacher or TA in class.
- Setting appropriate and regular homework.
- IEPs are implemented for those children who need them and are reviewed termly.
- Intervention programmes such as 'Rapid Maths' and 'Overcoming Barriers in Mathematics.'

Assessment and Recording

- *Teacher assessment:* Ongoing teacher assessment is carried out and pupils learning is responded to during 'day-to-day' teaching. These responses can be verbal and/or written. Written feedback in books is in response to the lesson objective/ success criteria of the lesson.
- *Cohort Provision Sheets:* At the beginning of each academic year, class teachers are made aware of each learner's current attainment based on the end of the last academic year's assessment. Cohort provision sheets are updated at the end of each term with any interventions/ actions required in order to increase pupil progress as required.
- *Target setting:* At the start of the academic year, class teachers analyse each learner's current attainment. From this data each child is set an individual target for mathematics.
- *Tracking grids:* At the end of each term, class teachers update mathematics class tracking grids in line with pupil attainment.
- *Data analysis :* At the end of each term class teachers / senior management team examine pupils' individual attainment and progress towards end of term/ year targets. Action is agreed to support learners who are not on target to reach their end of term target level. This may include an IEP, involvement in intervention groups or the need for outside specialist support.

Formal Assessments

Year 2 complete national SATs for mathematics in the summer term. Years 3 and 4 also complete the optional NFER tests to support teachers' assessments. In Year 4, the children also complete the MTC, online Multiplication Check for their multiplication tables.

Reporting to parents

- Parents receive an annual report indicating their child's achievement at the end of the Summer term.
- Parents are invited to an informal open evening during the Autumn term.
- Parents are invited to an annual consultation evening during the Spring term.
- At the end of the school year, parents of our Reception children receive their child's Foundation Stage Profile results and Learning Journal, showing progress throughout the Foundation Stage.
- Year 2 Parents receive their child's SATs results.

Homework

Finstall First School aims to provide parents and carers with opportunities to work with their children at home. These activities may only be brief, but are valuable in promoting children's learning in mathematics. Activities are sent home on a regular basis and can take the form of number games and tasks with some formal exercises for older children. Maths homework activities are also available on Education City and Sumdog which can be accessed via the school website using the child's username and password. Children are also expected to practice their multiplication tables. They have a log on to Times Table Rock Stars to assist with their learning and make this more fun.

Website

The school website http://www.finstallfirst.co.uk/website provides a range of supporting materials for parents including:
- links to mathematical websites
- resources to support mathematical understanding at home e.g. arrow partition cards, number lines
- Copies of mathematics targets for each year group
- Mathematics policies

Staff Continued Professional Development

The subject leader for mathematics attends mathematics subject leader training regularly and feeds back to staff at planned staff meetings as required. Through performance management, staff have the opportunity to identify areas of need and appropriate training is arranged. Staff meetings and INSET days also provide staff information and training.