SIXPENNY HANDLEY FIRST SCHOOL

Mathematics Policy

24th May 2018

This policy sets out the arrangements for the leadership and delivery of the Mathematics at Sixpenny Handley First School. This policy reflects our values and philosophy in relation to the teaching and learning of mathematics. It sets out a framework within which staff, both teaching and non-teaching work. It gives guidance on planning, teaching and assessment.

There is a statutory requirement for the teaching and learning of Mathematics. (National Curriculum Mathematics Document 2014) and in the Prime area of Learning, mathematics, number, shape, space and measure (statutory Framework for the Early Years Foundation Stage 2017)

Rationale

The teaching of mathematics for children at Sixpenny Handley First School emphasises the development of critical thinking and problem solving skills, which help children make connections to develop deeper understanding.

Aims

Children at Sixpenny Handley First School will:

- develop fluency and confidence in the fundamentals of mathematics
- recall and apply mathematical knowledge with increasing independence, accuracy and speed
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- solve problems by applying mathematics to a variety of routine and non- routine problems with increasing sophistication
- have extensive practice to develop fluency and mastery to succeed

National Curriculum Statutory Requirements:

<table>
<tr><td colspan="2">EYFS</td></tr>
<tr><td colspan="2">Numbers:

• Count reliably with numbers from 1 to 20.
• Place numbers in order and say which number is one more or one less than a

given number.

• Using quantities and objects, they add and subtract two single-digit numbers.
• Count on or back to find the answer.
• They solve problems, including doubling, halving and sharing.</td></tr>
<tr><td colspan="2">• Children use everyday language to talk about: Size, Weight, Capacity, Position, Distance, Time, Money,
• Children Recognise create and describe patterns.
• They explore characteristics of everyday objects and shapes and use language to describe them.</td></tr>
<tr><td>Year 1</td><td></td></tr>
<tr><td>Place Value

• To count to and across 100 forwards

and backwards from any given number

• To count, read and write numbers to

100 in numerals

• To count in multiples of twos, fives and

tens

• To identify one more/one less than a

given number

• To use language of: equal to, more

than, less than (fewer), most, least</td><td>Addition and Subtraction

• Read, write and interpret mathematical statements involving (+), subtraction (-), and equals (=) signs
• Use number bonds and related subtraction facts
• Add and subtract one-digit and two-digit numbers to 20, including zero
• Solve simple one-step problems involving multiplication and division, calculating the answer using concrete objects and pictorial representations, and missing number problems</td></tr>
</table>

• To recognise odd and even numbers • To read and write numbers from 1 to 20 in digits and words	
Multiplication and division • Solve simple one-step problems involving multiplication and division using concrete objects and arrays and teacher support • Group and share small quantities • Doubling numbers and quantities and finding simple fractions of objects	Fractions • Recognise, find and name a half as one of two-equal parts of an object, shape or quantity • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity
Measures Compare describe and solve practical problems for; • Lengths of heights (e.g.; long/short, heavier than, lighter than) • Mass or weight (e.g.; heavy/light, heavier than, lighter than) • Capacity/volume (full/empty, more than, less than, quarter) • Time (quicker, slower, earlier, later) Measure and begin to record the following: • Lengths and heights • Mass/weight • Capacity and volume • Time (hours, minutes, seconds • Recognise and know the value of different denominations of coins and notes • Sequence events in chronological order using language such as: before, next, first, tomorrow, yesterday • Recognise and use language relating to dates, including days of the week, weeks, months and years • Tell the time to the hour and half	• Geometry: properties of shapes Recognise and name common 2-D and 3-D shapes in different orientations and sizes Geometry: position, direction, motion • Order and arrange combinations of objects and shapes in patterns • Describe position, directions and movements, including half, quarter and three-quarter turns

past the hour and draw the hands on a clock face to show these times	
Year 2	
• Number and place value Count in steps of 2, 3 and 5 from 0, and count in tens from any number • Forward and backward • Recognise place value of each digit in a two-digit number • Identify, represent and estimate numbers using • different representations, including number lines compare and order numbers from 0 up to 100; use <,> and = signs read and write numbers to at least 100 in numerals and in words use place value and number facts to solve problems	Addition and subtraction • Solve simple one step problems with addition and subtraction • Use concrete objects and pictorial representations, including those involving numbers, quantities and measures • Apply 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 numbers 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 missing number problems

Multiplication and division • Recall and use multiplication and division facts for the 2, 5 and 10 times 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 multiplication of two numbers can be done in any order and division of one number by another cannot • Solve one-step problems involving multiplication and division, using materials and division facts, including problems in context	Fractions • Recognise, find, name and write fractions 1/3, 1⁄4, 2/4, and 3⁄4 of a length, shape, set of objects or quantity • Write simple fractions e.g. 1⁄2 of 6 = 3 and recognise the equivalence of two quarters and one half.
Measures • Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (oC); capacity (l/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • Compare and order lengths, mass, volume/capacity and record the results using <, > and = • Read relevant scales to the nearest numbered unit • Recognise and use symbols for pounds and pence; combine amounts to make a particular value and match	Geometry: Properties of shapes • Identify and describe the properties of 2-D shapes, including the number of sides and 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 • Compare and sort common 2-D and 3-D shapes and everyday objects

different combinations of coins to equal the same amounts of money; add and subtract money of the same unit including giving change • Solve simple problems in a practical context involving addition and subtraction of money • Compare and sequence intervals of time • Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock fact to show these times	
• Geometry: Position, direction, motion Order and arrange combinations of mathematical objects in patterns	• Data Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
• Use mathematical vocabulary to describe position, direction and movement, including distinguishing between rotation as a turn and in terms of right angles for quarter turns (clockwise and anti- clockwise), and movement in a straight line • Work with patterns of shapes, including those in different orientations	• Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • Ask and answer questions about totalling and compare categorical data
Year 3	
Number and place value • To count in multiples of 4, 8, 50, and 100; find 10 or 100 more or less than a given number • To recognise the place value of each digit in a 3- digit number • To compare and order numbers up to 1000 • To identify, represent and estimate numbers using different representations	**Addition and subtraction** 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 column 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

• To read and write numbers up to 1000 in numerals and words • To solve number problems and practical problems involving these ideas	value, and more complex addition and subtraction
Multiplication and division • To recall and use multiplication and division facts for the 3, 4 and 8 times tables • To write and calculate mathematical statements for multiplication and division using the x table that they know, including for 2-digit numbers x 1-digit numbers, using mental and progressing to formal written methods • To solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in with 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 part 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 • + and – fraction with the same denominator within one whole • Compare and order unit fractions, and fractions with the same denominators • solve problems that involve all the above
Measurement • Measure and compare, add and subtract: lengths (m/cm/mm); mass (Kg/g); volume/capacity; (l/ml) • Measure the perimeter of simple 2-D shapes • + and – 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	**Geometry** • 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 2 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

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 vocab 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 (calculate the time taken by particular events or tasks	
Statistics • 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	
Number and place value • Count in multiples of 6,7,9,25 and 1000 • Find 1000 more or less that 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	Number: Multiplication and division • Recall multiplication and division facts for multiplication tables up to 12 x 12 • Use place value, known and derived fact to multiply and divide mentally, including multiplying by 0 and 1; multiplying together three numbers • Recognise and use factor pairs and commutativity in

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 with increasingly large positive numbers • Read roman numerals to 100 (1 to C) and know that over time, the numeral system changed to include the concept of zero and place value	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
Number: Fractions (including decimals) • Recognise and shown 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 by involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit	Measurement: • Convert between different units of measure (for example; kilometres 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,

fractions where the answer is a whole number • Add and subtracts fractions with the same denominator • Recognise and write decimal equivalents to one quarter, one half and three quarters • 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	including money in pounds and pence
Geometry – properties of shape • Compare and classify geometric shapes, including quadrilaterals and triangles; isosceles, equilateral, scalene based on their properties and size • 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 • Draw a pair of axis on one quadrant, with equal scales and integer labels.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes, specified in the relevant programmes of study

CROSS CURRICULAR LINKS

Links are to be found between mathematics and a range of other curricular areas. However, the links should be genuine rather than contrived. Parents are actively encouraged to support their children's learning at home, as outlined in the Home Learning Policy. Support materials are available to parents in the School. Parents are informed of new initiatives and given guidance where appropriate.
NB: For parents we include anyone who has the primary responsibility for the care of the pupil.

Inclusion

The expectation is that children will move through the programmes of study at broadly the same pace. However, decisions about when to progress are always based on the security of pupils' understanding and their readiness to progress to the next stage. At Sixpenny Handley First School we provide additional support and challenge where necessary to secure and extend mathematical understanding. This will be addressed through planning and AFL. All pupils will have access to mathematics on an equal basis, irrespective of gender, race or religion, and at an appropriate level. As far as possible, any child with a specific disability will be provided with the same opportunities as his/her peers. Immediate intervention forms an integral part of mathematical teaching.

Planning and Assessment

In the Foundation Stage (2-5) mathematical learning follows children's lines of enquiry. Teachers provide a range of opportunities and enhancement activities to promote confidence and understanding of early mathematical concepts. Throughout the Foundation Stage, Numicon and other recourses will be freely available for the children to explore in their play. Each child in the Foundation Stage has their own online Tapestry Learning Journal. Regular observations and assessments are used throughout the Foundation Stage and are uploaded by both practitioners, parents and carers. These inform the children's next steps in their learning.

In Key Stages One and Two teachers use the Inspire Maths Teacher's Guides. The Inspire Maths Scheme was developed in Singapore by Doctor Fong Ho Kheong. It provides highly scaffolded learning frameworks with problem solving at its heart. It is built on a focused, coherent and cumulative spiral curriculum that continuously builds and consolidates knowledge to reach deep understanding. Inspire Maths has the concrete-pictoral-abstract (CPA) approach at its core. From early on in their school life, we expect children to use and understand numbers, which are abstract concepts. Many children struggle with this and can become confused. The CPA approach helps children achieve secure number sense; a sense of what numbers really represent and how to use them. A key feature of Inspire Maths is rigorous and regular assessment. All teachers also use 'School Pupil Tracker Online' to assess children's progress in mathematics. This is updated at least

once every half term. Standards are monitored in staff meetings and moderation sessions internally and externally.

Assessments are an informal part of every lesson and may be recorded in formative/informative records, such as: children's traffic lighting, verbal feedback, teacher assistant feedback sheets, and annotations on planning and in books.

Resources:

All teaching staff are responsible for ensuring the subject is well resourced.
Within the classroom setting toolkits are an essential part of maths learning. The children take ownership of these by choosing which manipulative they have access to. This includes, but is not limited to; number-lines, cubes, mini whiteboards, Diennes Rods and cubes etc.

Monitoring and Training:

Mathematics is monitored by the staff and leadership through lesson observations, These can be booked in advance or will be drop-ins that are not planned, to allow teachers and Subject Leader the opportunity to evaluate the effectiveness of teaching and learning across the school, scrutiny of work, pupil discussion and assessment methods. Teacher's individual needs are evaluated by self evaluation inline with performance management procedures and through continuing professional development.

Policy written by M Read (Mathematics Subject Leader)

Article 3
All organisations concerned with children should work towards what is best for each child.

Article 28
Children have a right to an education.

Article 29
Education should develop each child's personality and talents to the full. It should encourage children to respect their parents and their own and others cultures.