What Maths looks like at Sandiway Primary School
In Maths, we take our children on a journey that
is engaging, exciting and empowering for all

Curriculum Intent	By the time our pupils leave Sandiway they are skilled mathematicians. They develop a secure knowledge of mastery mathematical skills and are fluent in the 4 fundamentals of mathematics (number, calculation, shape and measure). They foster a sense of positivity towards the mathematical world. Our progressive, problem solving bases curriculum engages, excites and empowers our pupils as mathematicians.

Our Philosophy :

Mathematics is a fundamental part of each day. We believe that Maths teaches us how to make sense of the world around us and **empowers** our children to gain essential life skills as problem solvers and critical thinkers. We aim to provide children with the skills in order to develop the ability to calculate, communicate, reason and solve problems in real life contexts. This enables children to explore, understand, and appreciate relationships and patterns in both number and shape in their everyday life.

As part of our Sandiway "ROCKs" ethos, we believe all children can master mathematics. We wish to promote **engage**ment, **excite**ment and enthusiasm for mathematical learning through practical activities, cross-curricular links, exploration and discussion. We aim to promote confidence, resilience and competence with numbers and the number system through children working hard, making mistakes and pushing themselves to achieve. This in turn will equip children with learning behaviours that will support them into further education and beyond.

"Metacognition is an important skill that children must develop if they are able to be adaptable in the global community"

Ian Lloyd

Three key aims at the core of our mathematics curriculum at Sandiway are:

1. For children to be fluent in the relevant fundamentals of mathematics,
2. For children to reason creativity, identify patterns, be mathematically inventive, think flexibly using stem sentences,
3. For children to solve realistic routine and non-routine problems with increasing independence.

By achieving these aims, Sandiway children will leave Year 6 as knowledgeable, skilful and confident mathematicians who are **empowered, engaged** and **excited** for the next phase of their learning.

We will inspire children's understanding and curiosity about Maths by:
- ❖ Following a mastery maths curriculum using White Rose Maths as a core planning tool.
- ❖ Implement a mastering number program for KS1 to increase number sense, confidence and progress for our youngest mathematicians.
- ❖ Ensure ALL children are capable of succeeding in Maths.
- ❖ Discrete teaching daily maths lessons.
- ❖ Providing a progressive curriculum in both mathematical skills, knowledge and vocabulary.
- ❖ Embed high quality practical mathematical manipulatives and representations within every lesson.

- ❖ Clear and purposeful mathematical modelling by adults to demonstrate and explain key mathematical strategies and concepts.
- ❖ Cross curricular links are made where possible.
- ❖ Embed subitising and the composition of numbers to enable increased automaticity and number sense.

We encourage our children to be tolerant and responsible citizens through the understanding that people's mathematical understanding and reasoning is unique and therefore commands respect.

The basis of the knowledge and understanding at each stage, as set out in the EYFS framework and National Curriculum:

By the end of EYFS, pupils will have learnt:

ELG: Number
Children at the expected level of development will:
- ❖ Have 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.

ELG: Numerical Patterns
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.

By the end of key stage 1, pupils will have learnt:
Number: 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

Number: addition and subtraction
- ❖ 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

Number: 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

Number: 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 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
- ❖ 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.
- ❖ 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.

By the end of key stage 2, pupils will have learnt:

Number: 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

Number: 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.

Number: Fractions incl 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 (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].

Geometry
- ❖ 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.
- ❖ 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.

Curriculum Implementation	A typical lesson will include the following elements: ❖ FB4 – daily recap of prior learning, ❖ Hook - new learning and introducing key vocabulary often through a problem solving task; ❖ Main teaching activity including progression in fluency, reasoning and problem solving tasks. ❖ Guided practice – new learning is practiced during whiteboard work. ❖ Independent tasks are set for all children to access and they strive for 5 questions to be answered. A scaffold is provided for children who may need support (e.g. teacher/TA support, use of apparatus, smaller steps). Challenge tasks are set each day to stretch and apply thinking in a variety of contexts. ❖ Review providing opportunity for the children to explain/model what they have learnt. **This is how it works:** ❖ We follow a mastery maths curriculum using White Rose Maths as a core planning tool. ❖ Learning is carefully sequenced and progressive taking into account what has been taught before, and what knowledge and skills are needed for the next stage of our children's mathematical development. ❖ Key 'small step' are planned and carefully adapted. To provide time for reflection and revision of previous learning, as well as engaging children with a variety of topics over a term. ❖ Maths is taught as a discrete subject showing a progression of skills. ❖ Children use prior experiences to then build on new skills. ❖ The acquisition of skills and practise is presented in Maths and fluency books. ❖ Opportunities for both independent and collaborative work ❖ High quality resources through the CPA approach (concrete, pictorial, abstract). ❖ Concepts are taught through high quality mathematical models, images and tools. ❖ Mathematical models are consistently used through school. ❖ Teachers are supported with their subject knowledge. ❖ Daily retrieval of prior learning through flashback 4 at the beginning of every lesson ❖ Daily lessons are taught with a balance between whole class work, group teaching, practical tasks and individual practice to encourage mathematical talk, support and independence. **This is what adults do:** ❖ Clear and positive modelling within maths lessons, encouraging an environment where everyone is a mathematician. ❖ Daily lessons follow Rosenshine's key principles of instruction, ensuring children retain and revisit prior learning through daily retrieval practice using Flashback 4. ❖ Model and scaffold mathematical thinking by sharing own thoughts using planned stem sentences. ❖ Teachers introduce new concepts in a logical sequence. ❖ Create a learning environment rich in practical resources that support learning. ❖ To model the correct terminology for practical maths

manipulatives and representations.

❖ Monitoring of arithmetic and maths books.
❖ High quality mathematical vocabulary is clearly modelled during lessons to develop children's accuracy and knowledge.
❖ Engage in CPD to ensure high quality subject knowledge.
❖ Regular retrieval practise of previous learning and effective questioning to ensure learning is memorable.
❖ Encourage children to use the correct mathematical language and terminology to discuss their mathematics and to explain their reasoning using purposeful stem sentences.
❖ Using our "I do, you do" lesson structure, staff will identify any gaps in learning and any opportunities to address misconceptions.

This is how we support and ensure access for all children:
❖ The maths curriculum is equitable and appropriate for all groups ensuring full access and parity for all pupils.
❖ Small group/1:1 adult support given where required.
❖ Number stacks interventions planned and assessed to ensure fit for purpose and progress.
❖ Ensuring that a range of equipment and resources are available to ensure success for all pupils.
❖ Teacher and self-assessment to quickly identify any child who requires additional support in specific skills.
❖ Pupils then receive additional support or resources.
❖ Pupils are seated in mixed ability groups; however, teachers may group children by ability if they feel it best suits the needs of the children within that lesson.

There are opportunities outside of the main lesson for children to revisit and revise prior learning. Maths Fluency Books are used in each class three to four days a week for an additional 15 minutes. These tasks include questions covering all topic areas of the maths curriculum that have already been taught. These sessions could also include mental maths questions which are planned to cover oral work and mental/arithmetic calculations – this will involve the whole class in tasks which again aim to revisit and revise previous learning.

This is how we challenge:
❖ Support of tasks, or outcomes is planned.

	❖ Small group or 1:1 feedback to further challenge. ❖ Open-ended tasks. ❖ Through questioning. ❖ Encouraging self-evaluation and testing of ideas. ❖ Peer learning.
Curriculum Impact	**This is what you might typically see:** ❖ Happy and engaged learners ❖ A variety of independent, paired and group work ❖ Engagement and perseverance ❖ Self-motivated children ❖ Children talking positively about maths, sharing and reflecting on their learning **This is how we know how well our pupils are doing:** ❖ Observations of maths lessons ❖ Monitoring of maths books and working walls ❖ Verbal feedback from teacher to pupil ❖ Verbal feedback from pupil to teacher/TA ❖ Pupil voice conversations with Subject Leaders/ SLT ❖ Photo evidence on Seesaw of practical learning ❖ Monitoring of children's progress over time **This is the impact of the teaching:** ❖ Confident children who can talk about maths. ❖ Children who are enjoying their learning in maths. ❖ Children who are equipped with a range of mathematical skills ❖ Children who know how to use a range of mathematical strategies in order to solve a wider range of problems including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculations. By implementing the intent, children should be confident in the following areas: ❖ being fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. ❖ solving problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios ❖ reasoning mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language. ❖ having an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately to be successful in mathematics. It is the role of the maths subject leader to ensure continuity and progression across the whole school. This is carried out through the following opportunities: book looks, learning walks, pupil voice, teacher voice and moderation meetings. Pupils progress meetings are also held within team meetings on a termly basis

and middle managers report to SLT. This information is used by the maths subject leader to amend any intervention groups and ensure that those children who are not working at age related expectations are provided with the support they need.

Pupil Voice

Each term, the views of children from across the school are sought to assess our children's enjoyment of mathematics.

Assessment
The assessment of maths at Sandiway is through half termly NTS assessments in both arithmetic and reasoning from Y2 – Y6. The analysis of these assessment informs and identifies gaps in learning which teachers carefully plan and sequence within daily flashback 4's or morning fluency questions. Furthermore, our lesson design structure ensures misconceptions are identified during the lesson and addressed through verbal feedback. Statutory testing is completed in Y4 (Multiplication check) and Y6 (SATs).

Teacher judgements are made to identify elements in children's independent work judging them as working towards, expected and greater depth within their current year group. Throughout the cycle the teacher will be responding to children's work providing praise, support, encouragement and next steps to move their work forward.