

Introduction

This policy outlines the teaching, organisation and management of the mathematics taught and learnt at Wix Primary School. The school's policy for mathematics is based on 'The Renewed Framework for teaching mathematics from Reception to Year 6 (2006).'

The Nature of Mathematics

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Using the Programmes of Study from the National Curriculum and the Renewed Framework for Teaching Mathematics (2006) it is our aim to develop:

- A positive attitude towards mathematics and an awareness of the fascination of mathematics;
- Competence and confidence in mathematical knowledge, concepts and skills;
- An ability to solve problems, to reason, to think logically and to work systematically and accurately;
- Initiative and an ability to work both independently and in cooperation with others;
- An ability to communicate mathematics;
- An ability to use and apply mathematics across the curriculum and in real life;
- An understanding of mathematics through a process of enquiry and experiment.

Planning and Organisation

Teaching time

To provide adequate time for developing Numeracy skills each class teacher will provide at least 4 daily mathematics lessons per week. This may vary in length but will usually last for about 45 to 60 minutes. Additional mathematics may be taught within other subject lessons when appropriate.

Teachers of the Reception children base their teaching on objectives in the Framework for Reception; this ensures that they are working towards the 'Early Learning Goals for Mathematical Development'. Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into year 1 they are familiar with the 45 minute lesson.

Class Organisation

From year 1, all pupils will have a dedicated daily mathematics lesson at least 4 days per week. Within these lessons there will be a good balance between whole-class work, group teaching and individual practice.

A Typical Lesson

A typical 45 to 60 minute lesson in year 1 to 6 will be structured like this:

- Oral work and mental calculation. This will involve whole-class work to rehearse, sharpen and develop mental and oral skills.
- The main teaching activity. This will include both teaching input and pupil activities and a balance between whole class, grouped, paired and individual work.
- A Plenary. This will involve work with the whole class to sort out misconceptions, identify progress, to summarise key facts and ideas and what to remember, to make links to other work and to discuss next steps.

Planning

Lessons are planned using a common planning format (see Appendix 1) from the Wandsworth LGFL site: www.wandsworthlgfl.net, and are collected and monitored by the Team Leader.

Teachers of the Reception class base their teaching on objectives in the Framework for Reception; this ensures that they are working towards the 'Early Learning Goals for Mathematical Development'. Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1 they are familiar with a 45-minute lesson.

Links between mathematics and other subjects

Mathematics contributes to many subjects within the primary curriculum and opportunities will be sought to draw mathematical experience out of a wide range of activities. This will allow children to begin to use and apply mathematics in real contexts.

SCHOOL AND CLASS ORGANISATION

How we cater for children who are more able

For the majority of the week the more able children at mathematics will be taught with their own class and stretched through differentiated group work and extra challenges. When working with the whole class, teachers will direct questions towards the more able (at their ability level) to maintain their involvement. However for one session a week the more able children may be withdrawn when possible from class to work in a small group on problem solving activities at an appropriate level.

How we cater for pupils with particular needs

The daily mathematics lesson is appropriate for all pupils. Teachers will involve all pupils through differentiation.

In the daily mathematics lesson we support children with English as an additional language in a variety of ways; e.g. repeating instructions, speaking clearly, emphasising key words, using picture cues, playing mathematical games, encouraging children to join in counting, chanting, finger games, rhymes etc...

IWBs and ICT are important resources for many reasons, one of which is supporting children with visual needs.

Pupils with special educational needs and individual education plans

Within the daily mathematics lesson teachers aim to provide activities to support children who find mathematics difficult. Children with SEN are taught within the daily mathematics lesson and are encouraged to take part when and where possible.

Where applicable children's Provision Maps incorporate suitable objectives from the Renewed Numeracy Framework and teachers keep these objectives in mind when planning work. The children are also supported through Wave 3 intervention.

The support staff are timetabled to support groups and individual children they work collaboratively with the class teacher. The support teacher feeds back to the class teacher when appropriate to inform evaluations, assessment and future planning.

Pupils records of their work

There are occasions when it is not necessary to record mathematics in a permanent form, but there are also occasions when it is both quick and convenient to carry out written calculations. It is also important to record aspects of mathematical investigations. Children are taught a variety of methods for recording their work and they are encouraged and helped to use the most appropriate and convenient method of recording.

Children are encouraged to use mental strategies before resorting to a written algorithm.

Recording work may involve children making rough jottings first followed by recording actual answers for the teacher's attention. All children are encouraged to work tidily and neatly when recording their actual answers but jottings may take any form and are important evidence for the teacher.

Marking

Work in mathematics can generate a great deal of marking and it is recognised that it is not always necessary to mark every piece of work. The children can sometimes mark exercises with support and guidance from the teacher. Where appropriate children in KS2 are encouraged to check computational exercises with a calculator. This can foster independence in the children, who can seek help if they are unable to locate and correct their errors. Teachers will mark in blue pen in KS1 and black pen in KS2.

Homework

See homework policy.

Resources

The classes in KS1 have the majority of the necessary mathematics equipment located within the classrooms

The classes in KS2 tend to use resources which are located in a central resource area (second floor, outside the staff room)

Information and communication Technology

ICT will be used in various ways to support teaching and motivate children's learning. ICT will involve the computer, calculator, and audio-visual aids. They will however only be used in the daily mathematics lesson when it is the most efficient and effective way of meeting the lesson objective.

Assessment

Assessment will take place at two connected levels: short-term, medium-term and long-term. These assessments will be used to inform teaching in a continuous cycle of planning, teaching and assessment.

Short-term assessment will be an informal part of every lesson. The teacher will share the objectives for the lesson with the children and make sure they are clear what is being expected of them to successfully achieve the objective. This is a necessary part of assessment for learning and helps the children take ownership for their own learning. The short term assessment will also involve the teacher checking the children's understanding at the end of the session to inform future planning and lessons.

Medium-term assessment will take place on a half termly basis and will cover the key objectives highlighted in the Renewed Framework covered during the half term. This will be through the Rising Stars assessments carried out at the end of each unit. The outcomes of the assessments will be recorded by the class teacher.

Long-term assessment will take place three times during the year. The first assessment being the NFER mathematics tests which involve the children from year 1 to 6 and are carried out during October, the second NFER test will take place in February and the third assessment will take place towards the end of the school year to assess and review pupils' progress and attainment. These will be made through compulsory National Curriculum mathematics tests for pupils in year 2 and 6 and supplemented by the optional QCA tests. Teachers will also draw upon their class record of attainment against key objectives and supplementary notes and knowledge about their class to produce a summative record. Accurate information will then be reported to parents and the child's next teacher.

Target setting

Teachers in years 1-6 will use the key objectives from the new framework to set individual targets. They will stick the relevant level in the front of the children's books and highlight the in green the objectives that have been achieved and in yellow the targets that the children are currently working on. (See appendix 2).

MANAGEMENT OF MATHEMATICS

Role of the Team Leader

- Teach demonstration lessons;
- Ensure teachers are familiar with the framework and help them to plan lessons;
- Lead by example in the way they teach in their own classroom;

- Prepare, organise and lead INSET, with the support of the Head teacher;
- Work co-operatively with the SENCO;
- Observe colleagues from time to time with a view to identifying the support they need;
- Attend INSET provided by LA Numeracy consultants;
- Inform parents;
- Discuss regularly with the SMT the progress of implementing the Strategy in the school.
- Collect examples of work for portfolio

Completed by

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Maths Key objectives for class use in target setting differentiated into 3 levels

Reception

1: some children can only 2: most children should 3: a few have progressed further and can

1	Say and use the number names in order in familiar contexts.-To5
2	Say and use the number names in order in familiar contexts.-To 10
3	Say and use the number names in order in familiar contexts.-To 20 and beyond
1	Count reliably up to 5 everyday objects.
2	Count reliably up to 10 everyday objects.
3	Count reliably beyond 10 everyday objects.
1	Recognise numerals 1 to 9.
2	Recognise numerals 0-10
3	Recognise numerals 10 and beyond
1	Say which is more or less
2	Use language such as more or less, greater or smaller, heavier or lighter, to compare two numbers or quantities.
3	Say a number that lies between 2 given numbers
1	Find one more or one less than a number from 1 to 5
2	Find one more or one less than a number from 1 to 10
3	Find one more or one less than a number from 10 and beyond
1	Begin to relate addition to combining two groups of objects, and subtraction to 'taking away' and being to use related vocabulary
2	Select 2 groups of objects to make a given total
3	Remove a smaller number from a larger to find how many are left by counting back from the larger number
1	Talk about, recognise and recreate simple patterns.
2	Create repeating patterns
3	Create symmetrical patterns
1	Use language such as circle or bigger to describe the shape and size of flat shapes.
2	Use language such as circle or bigger to describe the shape and size of solids shapes.
3	Begin to make solids and flat shapes
1	Use everyday words to describe position
2	Use everyday words to describe direction
3	Move objects to given positions and in given directions

1	Begin to understand and use the vocabulary related to money
2	Know the amount coins are worth
3	Sort coins including £1 and £2 and use them in role play

Year 1

Key: 1: some children can only 2: most children should 3: a few have progressed further and can

1	Count reliably at least 10 objects.
2	Count reliably at least 20 objects.
3	Count reliably beyond 20 objects
1	Count on and back in ones from any small number
2	Count in tens from zero
3	Count back in tens to zero
1	Read, write and order numbers from 0 to at least 10
2	Read, write and order numbers from 0 to at least 20;
3	Understand and use the vocabulary of comparing and ordering these numbers.
1	Within the range 0 to 20, say the number that is 1 or 10 more or less than any given number.
2	Within the range 0 to 30, say the number that is 1 or 10 more or less than any given number.
3	Say the number that is 1 or 10 more or less than any given number. Beyond 30
1	Understand the operation of addition and use the related vocabulary.
2	Understand the operation of subtraction (as 'take away' or 'difference'), and use the related vocabulary.
3	Begin to use +, - and = signs to record calculations in a number sentence
1	Know by heart total of pairs of numbers to 10
2	Know by heart all pairs of numbers with a total of 10
3	Know by heart all pairs of numbers with a total of 20
1	Use mental strategies to solve simple problems using counting,
2	Use mental strategies to solve simple problems using addition, subtraction, doubling and halving.
3	Explain methods and reasoning orally.
1	Compare two lengths, masses or capacities by direct comparison.
2	Compare more than two lengths, masses or capacities by direct comparison.
3	Measure using standard or uniform non-standards units.
1	Use everyday language to describe features of familiar 2-D shapes.
2	Use everyday language to describe features of familiar 3-D shapes.
3	Visualise number of sides and corners on 2-D shapes

Year 2

Key 1: some children can only 2: most children should 3: a few have progressed further and can

1	Count, read, write and order whole numbers to at least 50; know what each digit represents (including 0 as a place holder).
2	Count, read, write and order whole numbers to at least 100; know what each digit represents (including 0 as a place holder).
3	Count, read, write and order whole numbers beyond 100; know what each digit represents (including 0 as a place holder).
1	Counting on or back in ones or tens from any two-digit number
2	Count on in hundreds from and back to zero
3	Count in twos from and back to zero
1	Understand that with addition a number always gets bigger and with subtraction it always gets smaller
2	Understand that subtraction is the inverse of addition
3	State the subtraction corresponding to a given addition and vice versa.
1	Know by heart all addition and subtraction facts for each number to at least 10.
2	Know by heart all addition and subtraction facts for each number to at least 20.
3	Know by heart all pairs of multiples of 10 with a total of 100
1	Understand the operation of multiplication as repeated addition
2	Understand the operation of multiplication as describing an array.
3	Begin to understand division as grouping
1	Half even numbers to 10
2	Double numbers to 10
3	Know and use halving as the inverse of doubling
1	Know by heart facts for the 2 multiplication table.
2	Know by heart facts for the 10 multiplication table.
3	Know by heart facts for the 5 multiplication table.
1	Compare lengths, masses and capacities
2	Measure using standard units; suggest suitable units and equipment for such measurements.
3	Estimate measurements using standard units
1	Read a simple scale to the nearest labelled division
2	Use a ruler to draw and measure lines to the nearest centimetre.
3	Record measurements as, '3 and a bit metres long' or 'about 8 centimetres' or nearly 3 kilometres heavy'.
1	Visualise number of sides and corners on 2-D shapes
2	Use the mathematical names for common 2-D and 3-D shapes and describe some of their features.
3	Visualise number of sides, faces and corners on 2-D and 3-D shapes
1	Use mathematical vocabulary left and right to describe direction and movement
2	Use mathematical vocabulary clockwise and anti-clockwise to describe direction and movement
3	Recognise quarter and half turns and know a right angle is a measure of a quarter turn and recognise them in squares and rectangles

1	Choose and use appropriate operations to solve problems
2	Use efficient calculation strategies to solve problems
3	Explaining how the problem was solved orally and where appropriate in writing

Year 3

Key 1: some children can only 2: most children should 3: a few have progressed further and can

1	Read, write and order whole numbers beyond 100; know what each digit represents (including 0 as a place holder).
2	Read, write and order whole numbers to at least 1000; know what each digit represents.
3	Read, write and order whole numbers to and beyond 1000; know what each digit represents.
1	Count on or back in tens from any two digit number
2	Count on or back in tens or hundreds from any three-digit number
3	Count on or back in tens or hundreds from any four-digit number
1	Recognise unit fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$, and use them to find fractions of shapes
2	Recognise unit fractions such as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$, and use them to find fractions of numbers
3	Begin to recognise simple fractions that are several parts of a whole, i.e. $\frac{3}{4}$ $\frac{5}{10}$
1	Know by heart all addition and subtraction facts for each number to 20.
2	Know by heart all pairs of multiples of 100 with a total of 1000
3	Derive quickly all pairs of multiples of 5 with a total of 100
1	Add mentally a 'near multiple of 10' to a two-digit number
2	Subtract mentally a 'near multiple of 10' from a two-digit number
3	Use patterns of similar calculations
1	Know by heart facts for the 2, 5 and 10 multiplication tables
2	Know by heart facts for the 3
3	Know by heart facts for the 4
1	Understand division as grouping (repeated subtraction) or sharing
2	Recognise that division is the inverse of multiplication
3	Begin to find remainders after simple divisions
1	Use units of time and know the relationships between them (second, minute, hour).
2	Use units of time and know the relationships between them (day, week, month, year).
3	Read the time to 5 minutes on an analogue clock and 12 hour digital clock, and use notation 9.40.
1	Recognise all coins and notes
2	Understand and use £.p notation.
3	Understand how p relates to £ and place value
1	Choose and use appropriate operations (including multiplication and division) to solve word problems
2	Explain methods and reasoning orally
3	Explain methods and reasoning where appropriate in writing
1	Identify right angles.
2	Recognise that a straight line is equivalent to 2 right angles
3	Compare angles with a right angle
1	Identify and sketch lines of symmetry in simple shapes
2	Recognise shapes with no lines of symmetry.
3	Sketch the reflection of a simple shape in a mirror line along one edge
1	Solve a given problem by organising and interpreting numerical data in simple lists
2	Solve a given problem by organising and interpreting numerical data in tables and diagrams.
3	Solve a given problem by organising and interpreting numerical data in graphs

Year 4

Key 1: some children can only 2: most children should 3: a few have progressed further and can

1	Read, write and order whole numbers to 1000; know what each digit represents.
2	Use symbols correctly, including less than (<), greater than (>), equals (=).
3	Write number sentences including <, >, =
1	Round any positive integer less than 100 to the nearest 10.
2	Round any positive integer less than 1000 to the nearest 10 or 100.
3	Round any positive integer to the nearest 10 or 100 and 1000.
1	Begin to recognise simple fractions that are several parts of a whole, i.e. $\frac{3}{4}$ $\frac{5}{10}$
2	Recognise mixed numbers; recognise the equivalence of simple fractions.
3	Order simple fractions
1	Use known number facts and place value to add mentally, including any pair of two-digit whole numbers.
2	Use known number facts and place value to subtract mentally, including any pair of two-digit whole numbers.
3	Use known number facts and place value to add or subtract mentally, including any pair of three-digit whole numbers.
1	Carry out column addition of two integers less than 1000, and column addition of more than two such integers.
2	Carry out column subtraction of two integers less than 1000, and column addition of more than two such integers.
3	Carry out column addition with any amount of numbers
1	Know by heart facts for the 2, 5 and 10 multiplication tables.
2	Know by heart facts for the 2, 3, 4, 5 and 10 multiplication tables.
3	Know by heart facts for the 2, 3, 4, 5, 6, 7, 8, 9 and 10 multiplication tables.
1	Derive quickly division facts corresponding to the 2, 5 and 10 multiplication tables.
2	Derive quickly division facts corresponding to the 2, 3, 4, 5 and 10 multiplication tables.
3	Derive quickly division facts corresponding to the 2, 3, 4, 5, 6, 7, 8, 9 and 10 multiplication tables.
1	Recognise that some numbers do not share equally
2	Find remainders after division.
3	Carry out short division of a three-digit by a single-digit integer.
1	Know which unit of measure is appropriate to use
2	Know and use the relationships between familiar units of length, mass and capacity.
3	Know equivalent of $\frac{1}{2}$, $\frac{1}{4}$ $\frac{3}{4}$ of 1km, 1kg, 1m etc.
1	Classify polygons, using a criteria
2	Classify polygons, using criteria such as number of right angles, whether or not they are regular, symmetry properties.

3	Classify triangles, scalene, isosceles. Equilateral, using criteria such as equal sides, equal angles, lines of symmetry
1	Choose appropriate number operations and ways of calculating (mental, mental with jottings, pencil and paper)
2	Choose and use appropriate number operations and ways of calculating (mental, mental with jottings, pencil and paper) to solve problems.
3	Choose and use appropriate number operations and ways of calculating (mental, mental with jottings, pencil and paper) to solve multiple step problems.

Year 5

Key 1: some children can only 2: most children should 3: a few have progressed further and can

1	Multiply and divide any positive integer up to 10 000 by 10 and understand the effect.
2	Multiply and divide any positive integer up to 10 000 by 10 or 100 and understand the effect.
3	Multiply and divide decimals mentally by 10 or 100 and integers by 1000 and explain the effect
1	Order a given set of positive integers.
2	Order a given set of positive and negative integers.
3	Order decimal numbers
1	Use decimal notation for $\frac{3}{4}$, $\frac{1}{4}$ and $\frac{1}{2}$
2	Use decimal notation for tenths and hundredths.
3	Use decimal notation for tenths, hundredths and thousandths
1	Round a number with one decimal place to the nearest integer.
2	Round a number with one or two decimal places to the nearest integer.
3	Round a number with two decimal places to the nearest tenth or to the nearest whole number
1	Understand that p is a fractions of £1
2	Relate fractions to division and to their decimal representations.
3	Recognise the equivalence between the decimal and the fraction forms of one half, one quarter, three quarters, one eighth...and tenths, hundredths and thousandths
1	Calculate mentally a difference such as 806 - 293.
2	Calculate mentally a difference such as 8006 - 2993.
3	Use known number facts and place value to consolidate mental subtraction
1	Carry out column addition and subtraction of positive integers less than 1000.
2	Carry out column addition and subtraction of any given numbers
3	Extend written methods to column addition and subtraction of numbers involving decimals
1	Know by heart all multiplication facts up to 10 x 10.
2	Derive quickly corresponding to tables up to 10x10 division facts
3	Apply times table and place value knowledge to multiply i.e.60x60
1	Carry out short multiplication and division of a three-digit by a single-digit integer.
2	Use the repeated subtraction method of divisions to divide numbers less than 100.
3	Use the repeated subtraction method of divisions to divide any numbers by chunking.
1	Carry out long multiplication of a one-digit by a two-digit integer.
2	Carry out long multiplication of a two-digit by a two-digit integer.
3	Carry out long multiplication of any given numbers
1	Understand area measured in square centimetres (cm ²) and what this means
2	Understand area measured in square centimetres (cm ²); understand and use the formula in words 'length x breadth' for the area of a rectangle.

3	Calculate the perimeter and areas of simple compound shapes that can be spilt into rectangles
1	Classify triangles, scalene, isosceles. Equilateral, using criteria such as equal sides, equal angles, lines of symmetry
2	Recognise parallel and perpendicular lines, and properties of rectangles.
3	Describe and visualise properties of solid shapes such as parallel or perpendicular faces or edges
1	Use addition and subtraction to solve simple word problems involving numbers and quantities, including time, explaining methods and reasoning.
2	Use all four operations to solve simple word problems involving numbers and quantities, including time, explaining methods and reasoning.
3	Use all four operations to solve multiple step word problems involving numbers and quantities, including time, explaining methods and reasoning.

Year 6

Key 1: some children can only 2: most children should 3: a few have progressed further and can

1	Multiply and divide decimals mentally by 10 or 100 and explain the effect.
2	Multiply and divide decimals mentally by 10 or 100, and integers by 1000, and explain the effect.
3	Multiply and divide number and decimals mentally by 10 or 100, 1000 and 100000 and explain the effect.
1	Order a mixed set of numbers with up to two decimal places.
2	Order a mixed set of numbers with up to three decimal places.
3	Order a mixed set of numbers with up to three decimal places and explain reasoning
1	Recognise equivalent fractions
2	Reduce a fraction to its simplest form by cancelling common factors.
3	Add fractions by changing to a common denominator
1	Know that to find fractions of a number you divide by the denominator and times by the numerator
2	Use a fraction as an operator to find fractions of numbers or quantities (e.g. $\frac{5}{8}$ s of 32, $\frac{7}{10}$ of 40, $\frac{9}{100}$ of 400 centimetres).
3	Explain reasoning orally and in writing
1	Understand percentage as the number of parts in every 100
2	Find simple percentages of small whole-number quantities.
3	Find percentages of any whole-number quantity by converting to a fraction.
1	Carry out column addition and subtraction of any given whole numbers
2	Carry out column addition and subtraction of numbers involving tenths
3	Carry out column addition and subtraction of numbers involving any decimals
1	Know by heart all tables to 10x10
2	Derive quickly division facts corresponding to multiplication tables up to 10 x 10.
3	Multiply decimals using know tables facts
1	Carry out short multiplication and division
2	Carry out short multiplication of numbers involving decimals.
3	Carry out short division of numbers involving decimals.
1	Carry out long multiplication of a three-digit by a one-digit integer.
2	Carry out long multiplication of a three-digit by a two-digit integer.
3	Carry out long multiplication of a three-digit by any digit integer.
1	Use a protractor to measure acute and obtuse angles to the nearest degree.
2	Use a protractor to measure any angles to the nearest degree.
3	Use a protractor to measure and calculate reflex angles to the nearest degree.
1	Calculate the perimeter and area of rectangles and know what perimeter and area are measured in

2	Calculate the perimeter and area of simple compound shapes that can be split into rectangles.
3	Calculate the perimeter and area of compound shapes that can be split into rectangles.
1	Read and plot co-ordinates in two quadrants.
2	Read and plot co-ordinates in all four quadrants.
3	Read and plot co-ordinates in all four quadrants and recognise where a shape would be after reflection on x and y axis
1	Choose and use all four operations to solve worded problems
2	Identify and use the appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities.
3	Explain methods and reasoning.
1	Present data in tables, graphs and charts.
2	Solve a problem by extracting and interpreting information presented in tables, graphs and charts.
3	Find the mode, median, mean and range of a set of data

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