



Billingham C of E Primary School

Mathematics Policy



Our Vision Statement

Working together to raise aspirations, empowering a community of hope. We seek to develop resilient, curious and creative minds, inspiring everyone to shine bright and be positive members within our church school community.

‘Ask and it shall be given, seek and you will find, knock and the door will be opened.’
Matthew 7.7”

Rationale/Intent

At Billinghay CE Primary it is our intent that our children are provided with a mathematics curriculum which is broad, balanced and fully inclusive, helping all our pupils gain coherent knowledge and understanding of core mathematical concepts. We aim to equip our children for their life long mathematics journey, much as St Thomas experienced a journey both physically and also with his faith. We encourage our children to challenge themselves, ask questions, develop curious minds and resilience, as St Thomas did. We provide a wide range of practical and active Maths experiences centred around the mastery approach. Our curriculum is built around the White Rose Maths Programme and follows the small steps of progression with lessons adapted in order to suit the learning styles of all our pupils throughout the key stages. It is then supplemented with a variety of teaching and learning resources such as Nrich, NCETM, Primary stars and I see reasoning to build a deeper level of the mathematics concepts. Our curriculum is driven by four of our key learning behaviours to encourage our pupils to become courageous, resilient, collaborative and inquisitive lifelong mathematical learners because *we believe that Mathematics is a key skill that helps us to make sense of the world around us*. As our pupils progress they will become equipped to confidently approach reasoning and problem-solving challenges, which will benefit them in Maths and in other areas of the curriculum. Our children will learn to love themselves, believe in their potential to achieve and find inner strength and resilience when facing challenges. In developing curiosity our children will learn from Jesus' readiness to use questions to challenge assumptions and arrive at their own conclusions when solving mathematical problems. We recognise the importance of Mathematics in every aspect of daily life; *enabling children to understand and appreciate relationships and pattern in both number and space*. We aim to support learners in becoming confident and articulate in the ability to apply their knowledge to solve a range of problems whilst using mathematical language. In line with the aims of the National Curriculum, we believe that Mathematics is essential for everyday life and that it forms a necessary part in the building of stable financial futures and the aspirational career choices that our learners strive for across various forms of employment; *science and technology, medicine, the economy, the environment and development and in public decision-making*. We encourage our children to seek and keep seeking and to knock and keep knocking as he promised that the door to a brighter future will be opened.

AIMS

- *Have a sense of the size of a number and where it fits into the number system*
- *Know by heart number facts, such as number bonds, multiplication tables*
- *Use what they know by heart to figure out answers mentally*
- *Calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies*
- *Make sense of number problems, including non-routine problems, and recognise the operations needed to solve them*
- *Explain their methods and reasoning, using correct mathematical terms*
- *Judge whether their answers are reasonable, and have strategies for checking them where necessary*
- *Suggest suitable units for measuring, and make sensible estimates of measurements*
- *Explain and make predictions from the numbers in graphs, diagrams, charts and tables.*



Early Years Foundation Stage

At Billinghay CE Primary School, children follow the Early Years Foundation Stage curriculum, which is supported by the White Rose Maths programme we are following as a whole school. We give all children the opportunity to talk and communicate in a widening range of situations and to practise and extend their range of vocabulary (appendix ii) and numeracy skills. They have the opportunity to explore, enjoy, learn about, and use mathematics in a range of situations. Mathematics is planned on a half termly basis and assessed using the criteria from the early learning goals. Mathematics is taught both as a discrete subject and within the whole Early Years curriculum to give children opportunities to use their Numeracy skills in real life situations.

Key Stages 1 and 2

Children have daily Maths lessons between 45 minutes and one hour long. The sequencing of this planning is provided by White Rose Maths as a base and then structure. These are adapted and differentiated by Class Teachers according to the needs to the children, in order to ensure that they deepen their existing understanding and make progress.

Problem solving and Reasoning

As a school we feel that problem solving and reasoning is a fundamental skill that our child need. As part of the WRMs curriculum children have access to problem solving and reasoning as part of every Maths lesson. Teachers will include extra problem-solving questions into their lessons using various resources such as I see reasoning, NCETM and NRICH. Early Years children will have access to continuous provision-based problem solving and reasoning activities.

Teaching Methods and Approaches

We follow a specific lesson structure that uses White Rose Maths as a base (see appendix iii)

NCETM Mastering Number Programme

At Billinghay the pupils in YR, Y1 and Y2 will have a 10 minute NCETM Mastering Number session 4 days per week. This session does not constitute as part of the Maths session and can be done at any time of the day, as it does not always link to current learning and may confuse the lesson learning objective. The aim of the programme is to build key skills and mastery concepts that children can apply to their maths lessons.

Parental Involvement

At Billinghay CE Primary School we recognise that parental involvement is an important factor in helping children achieve their best and actively encourage parents to become involved with their children's development in Mathematics.

Maths Working walls

We recognise the important role, display has in the teaching and learning of mathematics by having Maths work displayed in the school. Every class has a 'Maths Working Wall' which is a visual aid to support children

with their work. These should be updated based on the classes current topic and continually added to reflect the pace of learning. All staff will have a list of non-negotiables to inform them of working wall expectations and a vocabulary list. (Appendix ii)

Working walls should include:

- Topic title/focus
- Small steps for the week linked to WRM
- Vocabulary
- Modelling of current learning each day/step
- Question prompts.
- Problem solving/reasoning questions on display where applicable.
- Photos of children showing learning if applicable. (WAGOLL)

Resources

At Billinghay Primary School, resources for the delivery of the maths curriculum are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic-specific items are stored centrally. There are central stores in both KS1 and KS2 departments.

We use a variety of materials to facilitate the teaching of mathematics but recognise the need for the teaching of maths to be investigative and grounded in real life circumstances wherever possible.

Times tables starter sessions

The children in Years 1-6 will be completing times tables sessions 3 x weekly as a starter to their Maths lesson with the aim to build up their fluency and recall of times tables. This will be done through counting, songs, rapid recall, Times tables rock stars (TTRS) or games. Children will learn their times tables as 1x2 2x2 3x2 etc and the inverse. They will also learn the divisions to go with each times table. Below is an outline of which times tables each year group needs to cover across the year.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Rec/Year 1	Experience of counting in steps of 1s, 2s, 5s and 10s.					
Year 2	Counting in steps	2x	5x	10x	Revision	Revision
Year 3	Counting in steps	2x	5x 10x	3x	4x	8x
Year 4	6x 12x	11x	9x 7x	Revision of all.	Timetables check	Revision
Year 5	2x 5x 10x	3x 4x	6x 7x	8x 9x	11x 12x	Revision
Year 6						

Assessment and Record Keeping

We are continually assessing our children and recording their progress. We see assessment as an integral part of the teaching process and endeavour to make our assessment purposeful, allowing us to match the correct level of work to the needs of the children, thus benefiting the children and ensuring progress. For each unit of learning children will complete the WRM end of the unit assessment and then complete a NTS Rising Stars end of term assessments at the end of spring and summer terms. Standardised scores will be generated to see if pupils are working at age expectations. Data will be analysed to look at gaps in understanding and teaching



amended accordingly (inc any required interventions etc). Statutory Assessment Tests (SATs) are used for children in Year 6 in the Summer Term. Children in Year 4 are also required to take a multiplication tables check (MTC) in the Summer Term. The purpose of the check is to determine whether pupils can fluently recall their times tables up to 12, which is essential for future success in mathematics.

Equal Opportunities

As a staff we maintain an awareness of, and to provide for, equal opportunities for all our children in mathematics. No pupil will be discriminated against by age, sex, disability, religion or belief, or sexual orientation.

Special Educational Needs

Wherever possible we aim to fully include SEND children in the daily mathematics lesson so that they benefit from the emphasis on oral and mental work and by listening and participating with other children in demonstrating and explaining their methods.

Where necessary teachers will, in consultation with the SENCO, draw up a target within an Individual Educational Plan for a child. If a child's needs are particularly severe, they will work on an individualised programme written in consultation with the appropriate staff.

When planning teachers will try to address the child's needs through simplified or modified tasks or the use of support staff.

Where appropriate a group educational plan is developed with common objectives and learning targets for a group.

Role and Responsibilities of Mathematics Subject Leader

- *Monitor planning, teaching and learning in mathematics, to ensure continuity and progression.*
- *Ensure there is well sequenced and progressive curriculum map which contains the key knowledge, skills and vocabulary children need to be procedurally fluent in mathematics.*
- *Monitor standards in mathematics throughout the school, including SEND, more able, LAC, etc.*
- *Identify strengths and areas for improvement and to lead and drive improvements within the school.*
- *Keep up to date with new initiatives and train staff on these (also to facilitate in or out of school training for staff).*
- *Feed back to the Headteacher on standards in mathematics*

Monitoring and Review

The subject leader supports colleagues in their teaching, by keeping informed about current developments in mathematics, and by providing a strategic lead and direction for this subject; gives the headteacher an annual summary report which evaluates the strengths and weaknesses in mathematics and indicates areas for further improvement.



Allocated management time is used to review evidence of the children's work, and to observe mathematics lessons across the school. The quality of teaching and learning in mathematics is monitored and evaluated by the headteacher as part of the school's agreed cycle of lesson observations. A named member of the school's governing body is briefed to oversee the teaching of mathematics. The mathematics link governor meets regularly with the subject leader to review maths in school.

This policy will be reviewed at least once in each academic year.

Any questions or concerns regarding this policy should be made to Maths SL (L. McCaffrey) in the first instance.

Appendix i

Models and Representations Used Y1-6 For Addition:

Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Skill	Year	Representations and models	
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters Column addition
Add with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Models and Representations Used Y1-6 For Subtraction:

Skill	Year	Representations and models	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead string (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters Column addition

Skill	Year	Representations and models	
Subtract with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Subtract with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Models and Representations Used Y1-6 For Multiplication:

Skill	Year	Representations and models	
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Place value counters Base 10	Short written method Expanded written method
Multiply 3-digit by 1-digit numbers	4	Place value counters Base 10	Short written method
Multiply 4-digit by 1-digit numbers	5	Place value counters	Short written method

Skill	Year	Representations and models	
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	



Models and Representations Used Y1-6 For Division:

Skill	Year	Representations and models	
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects	Arrays Counters
Solve one-step problems with division (grouping)	1/2	Real life objects Number shapes Bead strings Ten frames	Number lines Arrays Counters
Divide 2-digits by 1-digit (no exchange sharing)	3	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (sharing with exchange)	3	Straws Base 10 Bar model	Place value counters Part-whole model

Skill	Year	Representations and models	
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange)	4	Base 10 Bar model	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division

Skill	Year	Representations and models	
Divide 4-digits by 1-digit (grouping)	5	Place value counters Counters	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division	List of multiples
Divide multi-digits by 2-digits (long division)	6	Written long division	List of multiples

Appendix ii

Maths Vocabulary for the National Curriculum.

This document sets out Key Stage 1 (KS1) and Key Stage 2 (KS2) Maths vocabulary under the National Curriculum as well as vocabulary for EYFS. The tables can be used to check pupils' understanding of new vocabulary introduced in years 1- 6. The lists are intended as a guide as to what pupils should know, and are not exhaustive. Of course, key terms may be introduced earlier as a challenge for our learners, although it is also important to ensure that learning is 'new' and carries an 'element of surprise'. It is expected that key vocabulary is displayed on 'Maths Learning Walls' at appropriate times during the academic year and in line with the current topic area being taught within the class and is promoted through mathematical talk in lessons.

New maths vocabulary for EYFS							
Number and Place Value	Addition and Subtraction	Multiplication and Division	Measure	Geometry (position and direction)	Geometry (Properties of shape)	Fractions	General/problem solving.
Number	Number line	Odd, even	Full, half, empty	Over, under, underneath, above, below, top, bottom, side	Sort	Whole	Listen, join in
One, two, three to twenty and beyond.	Add, more, plus, make, sum, total, altogether	Double, halve	Holds		Cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square	Equal	Say, think, imagine, remember
None	Double	Share, share equally	Container	On, in, outside, inside		One half	Start from
Count on/up/to/from/down	Half, halve	Group in pairs	Weigh, weighs, balance	In front, behind	Shape		Look at, point to
Before, after	Equals, is the same (including equals sign)	Divide	Heavy, heavier, heaviest, light, lighter, lightest	Front, back	Flat, curved, straight, round		Put
More, less, many, few, fewer, fewest, smaller, smallest	How many more to make...? How many more is... then...? How much more is...?		Scales	Before, after	Solid		What comes next?
Equal to, the same as			Time	Beside, next to	Corner		Find, use, make, build
Odd, even			Days of the week: Monday, Tuesday etc.	Middle	Face, side		Tell me, describe, pick out, talk about, explain, show me
Digit	Subtract, take away, minus.		Seasons: Spring, Summer, Autumn, Winter	Up, down, forwards, backwards, Sideways	Make, build, draw		Read, write
Numerical				Close, far			Tick, draw a line, ring
Compare			Days, week, month, year, weekend	Through			Cost
Order			Birthday, holiday	Towards, away from			Count, work out
Size			Morning, afternoon, evening, night	Side, roll, turn			Number line, number track, number square, number cards
Value			Bedtime,				
Between, halfway between							

			dinnertime, playtime				Counters, cubes, blocks, die, dice, dominoes, pegs, peg board
			Today, yesterday, tomorrow				Same way, different way
			Before, after, next, last				In order, in a different order
			Quickest, fastest, slowest				
			Clock				
			Once				
			First, second, third				
			Estimate				
			Too many, too few				
			Length, height				
			Longer, longest, shorter, shortest, taller, tallest, higher, highest				
			Money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay, change				
			How much? How many?				
			Total				

New maths vocabulary for year 1							
Number and Place Value	Addition and Subtraction	Multiplication and Division	Measure	Geometry (position and direction)	Geometry (Properties of shape)	Fractions	General/problem solving.
Greater, lesser	Number bonds	Once, twice, three times. Five times.	Midnight	Position	Group	Equal parts, four equal parts	Place, fit
Pair	Inverse	Count in tens (forwards from/ backwards from)	Now, soon, early, late	Around	Hollow	Two halves	Arrange, rearrange
Units, ones, tens	Near doubles	How many times?	Quick, quicker, quickly, fast, slow, slower	Opposite	Point, pointed	A quarter, two quarters	Change, change over
Ten more/less	Difference between	Lots of, groups of	Old, older, oldest, new, newer, newest	Apart	Edge		Split, separate
Figure (s)	How many fewer is...than...?	Multiple of, times, multiply, multiply by	Takes longer, takes less time	Between, edge, centre			Carry on, continue, repeat
In order/ A different order	How much less is...?	Repeated addition	Hour, o'clock, half past	Corner			Choose, collect
Above, below		Array, row, column	Watch, hands	Direction			Record, trace, copy, complete, finish, end
		Group in twos, threes, etc	How long ago? How long will it be to...? How long will it take to...? How often?	Journey			Fill in, shade, colour, cross, draw, draw a line between, join (up), arrow
		Divided by, left, left over	Always, never, often, sometimes, usually	Left, right			Answer, check, same number(s), different number(s), missing number(s)
			Once, Twice...	Across			Number facts
			First, second, third, etc	Near			Abacus, rods
				Along			Best way, another way
				To, from			
				Movement			
				Whole turn, half turn			
				Stretch, bend			

			Close to, about the same as, just over, just under				Not all, every, each
			Enough, not enough				
			Width, depth				
			Long, short, tall, high				
			Low, wide, narrow, deep, shallow, thick, thin				
			Far, near, close				
			Metre, ruler, metre stick				
			Costs more, costs less, dear(er), cheaper, costs the same as				

New maths vocabulary for year 2

Number and place value	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics	General/problem solving
Numbers to one hundred	Quarter past/to	Rotation	Size	Three quarters, one third, a third	Count, tally, sort	Predict
Hundreds	m/km, g/kg, ml/l	Clockwise, anticlockwise	Bigger, larger, smaller	Equivalence, equivalent	Vote	Describe the pattern, describe the rule
Partition, recombine	Temperature (degrees)	Straight line	Symmetrical, line of symmetry		Graph, block graph, pictogram, Represent	Find, find all, find different
Hundred more/less		Ninety degree turn, right angle	Fold		Group, set, list, table	Investigate
			Match		Label, title	
			Mirror line, reflection		Most popular, most common, least popular, least common	
			Pattern, repeating pattern			

New maths vocabulary for year 3

Number and place value	Addition and subtraction	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics
Numbers to one thousand	Column addition and subtraction	Product	Leap year	Greater/less than ninety degrees	Horizontal, vertical, perpendicular and parallel lines	Numerator, denominator	Chart, bar chart, frequency table, Carroll diagram, Venn diagram
		Multiples of four, eight, fifty and one hundred	Twelve-hour/twenty-four-hour clock	Orientation (same orientation, different orientation)		Unit fraction, non-unit fraction	Axis, axes
		Scale up	Roman numerals I to XIII			Compare and order	Diagram
						Tenths	

New maths vocabulary for year 4

Number and place value	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions and decimals	Data/statistics
Tenths, hundredths	Multiplication facts (up to 12x12)	Convert	Coordinates	Quadrilaterals	Equivalent decimals and fractions	Continuous data
Decimal (places)			Translation	Triangles		Line graph
Round (to nearest)	Division facts		Quadrant	Right angle, acute and obtuse angles		
Thousand more/less than	Inverse		x-axis, y-axis			
Negative integers	Derive		Perimeter and area			
Count through zero						
Roman numerals (I to C)						

New maths vocabulary for year 5						
Number and place value	Addition and subtraction	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions, decimals and percentages
Powers of 10	Efficient written method	Factor pairs Composite numbers, prime number, prime factors, square number, cubed number Formal written method	Volume Imperial units, metric units	Reflex angle Dimensions	Regular and irregular Polygons	Proper fractions, improper fractions, mixed numbers Percentage Half, quarter, fifth, two fifths, four fifths Ratio, proportion

New maths vocabulary for year 6							
Number and place value	Addition and subtraction	Multiplication and division	Geometry (position and direction)	Geometry (properties of shape)	Fractions, decimals and percentages	Algebra	Data/statistics
Numbers to ten million	Order of operations	Order of operations Common factors, common multiples	Four quadrants (for coordinates)	Vertically opposite (angles) Circumference, radius, diameter	Degree of accuracy Simplify	Linear number sequence Substitute Variables Symbol Known values	Mean Pie chart Construct

Appendix iii

Maths Lesson Structure Years 1-6

