Holyport CE Primary School & Foundation Unit

Mathematics Policy

Introduction

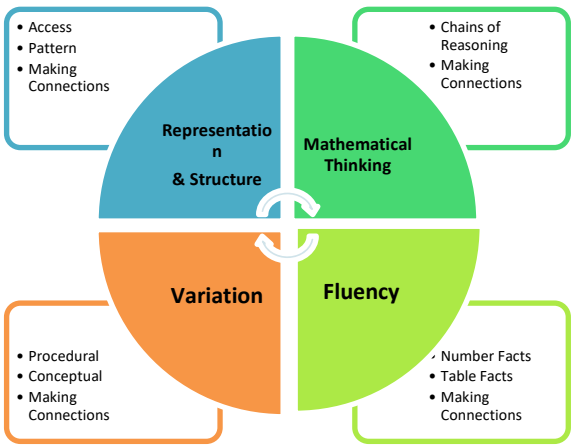
This policy outlines the purpose, nature and management of Mathematics within Holyport C.E Primary School. The implementation of this policy is the responsibility of all members of the staff.

Philosophy

We believe that it is important that our children develop a positive attitude towards mathematics and for them to see themselves as competent mathematicians. This is why when a pupil states that they don't understand or 'get' an aspect of mathematics we respond with 'yet'. We aim to develop fluency in every pupil as well as understanding and reasoning. We aim to develop their mathematical skills and knowledge so that they are able to apply them to a variety of curricular contexts and in the world around them.

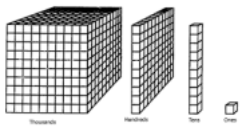
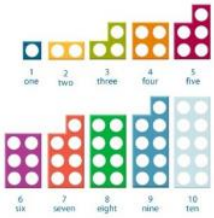
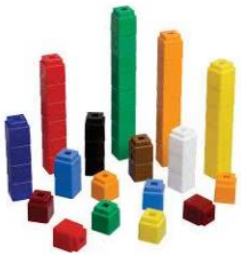
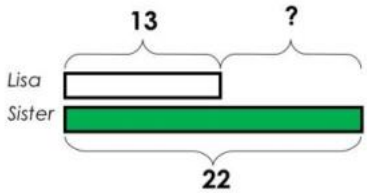
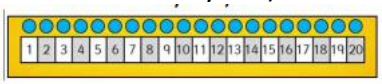
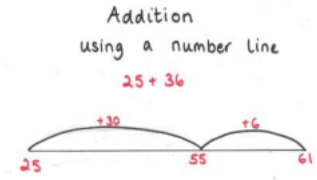
Teaching Mathematics at Holyport C.E Primary School

At Holyport we use the White Rose Maths Hub schemes of work as part of a mastery approach to teaching mathematics. This scheme provides opportunity for fluency, reasoning and problem solving activities within every lesson ensuring that the lesson has pace and that children are challenged in their learning. The use of this scheme also makes sure that there is full curriculum coverage in line with the National Curriculum. Teachers are able and encouraged to use additional resources (e.g. Inspire Maths and other text books that are mapped to this scheme) to support planning, coverage and differentiation within their own teaching. Teachers use Learning Objective stickers which identify the variable fluency skills, as well as the reasoning and problem solving skills being targeted in each lesson. Teachers are also encouraged to have problem solving and reasoning questions on stickers rather than worksheets. This encourages pupil focus and allows space for pupils to demonstrate their calculations and chosen strategies, which in turn develops their mathematical explanations. Our understanding of the Mastery approach is best explained with the following visual:



As we use the **C**oncrete **P**ictorial **A**bstract (**CPA**) approach as part of our daily lessons from reception up to Year 6 resourcing of manipulatives is particularly important as is the use of appropriate pictorial representations. Each class has access to a selection of physical resources to support this method of teaching and it is expected to see reference to use of resources and pictorial representations (e.g. the bar method) in weekly planning. The aim is not to move onto abstracts as quickly as possible but instead to instil and develop a deeper understanding of the mathematical concepts. In this way we may consolidate and practice skills by continually referring back to both concrete manipulatives as well as pictorial representations. Thus there should not be a rush onto the abstract and compact methods. Both concrete and pictorial should continue to be used throughout both KS1 and KS2.

Detail of calculation methods (algorithms), their link with the CPA approach and when they should be taught can be found in the Calculation Policy. However, it is important that conceptual understanding of the processes supports and underpins fluency of practiced algorithms.

Concrete →	**P**ictorial →	**A**bstract
Deines Cubes  Numicon  Cuisenaire rods  Unifix  *Any Manipulative For example lego, pencils, crayons, buttons, counters, bead strings etc.	Arrays  3 x 4 4 x 3 Representations  100 40 3  5 or 5 x 2  6 x 4  12 ÷ 4 Bar Models *Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.*  13 ? Lisa Sister 22	Number Tracks (this is a number line with the numbers already on.)  Number Lines (A blank line usually drawn by the pupil.)  Addition using a number line 25 + 36 +30 +6 25 55 61 Algorithms Expanded x 30 2 20 600 40 4 120 8 32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 Compact 33 X 4 132 1 When carrying we write the carried digit below the line. This ensures consistency across the school and avoids confusion with borrowing in subtraction.

Language and Vocabulary

At Holyport C.E Primary School both staff and pupils are expected to use the correct mathematical terminology from reception and right the way through the school to Year 6. A glossary of terms can be found in the Calculation Policy. When giving oral answers and explanations, pupils will be expected to use mathematical vocabulary. Pupils must be expected to (and may have to be taught to) give verbal responses using mathematical sentences. For example: What is half of twenty? The correct response is: Half of twenty is ten. If the pupil simply responds with 19 then the correct response should be modelled. This will support pupils' speaking and listening skills as well as aiding development of fluency.

The National Curriculum

The aims for Mathematics in the National Curriculum, and at Holyport C.E Primary School, are to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language.
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress on to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems rather than be accelerated through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding through additional practice, before moving on.

Spoken Language

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

The National Curriculum

The programme of study for mathematics are set out year-by-year for Key Stages 1 and 2 within the National Curriculum for Mathematics. What follows is an overview for each Key Stage.

Foundation Stage

In EYFS the children work in small and large groups for approximately 20 minutes daily depending on the focus for the week. Maths activities are accessible at all times during child initiated 'busy learning' time.

Children complete one adult led focused activity a week and practitioners collect a variety of evidence for example written evidence and observation on tapestry.

Key Stage 1

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

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

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils will read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2 (Years 3 and 4)

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils will develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching will also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It will ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. This will be assessed through the Year 4 Multiplication Check that takes place in June each year. Pupils will be tested on 25 mixed multiplication questions which they have 6 seconds to answer. The Check is administered electronically; pupils can use computers or tablets to complete the Check.

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

Upper Key Stage 2 (Years 5 and 6)

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils will develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures will consolidate and extend knowledge

developed in number. Teaching will also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils will read, spell and pronounce mathematical vocabulary correctly.

Non-negotiable and Key Learning for Mathematics

All pupils must completely achieve all aspects of the non-negotiables by the end of the academic year. These are Key Aspects of learning that if not achieved will cause further problems and disruptions to learning in subsequent years.

Nursery
• Match number objects to numerals up to 5
• Recite numbers up to 10 in different contexts; eg. Play, songs etc.
Reception
• Children count reliably with numbers from one to 20.
• Recognises numerals 1 to 10
• Count objects to 10 and begin counting beyond 10.

Year 1
• Count, read, write and order numbers to 100 in 10s
• Read and write numbers 1 to 20
• Know addition facts and derive related subtraction facts to at least 10
• Count out objects, quantify and compare
• Describe and name common shapes
• Use the language of position and direction
• Measure quantities and compare standard units

Year 2
• Count forwards and backwards from any starting number
• Secure addition and subtraction number facts to 20
• Add and subtract 10 and 10s
• Identify the value of the digit in two and three digit numbers and partition numbers into 1s, 10s and 100s
• Carry out mental and written addition and subtraction calculations involving one and two-digit numbers
• Identify simple fractions as and part of a set
• Understand multiplication and division and carry out the operations in practical contexts
• Recognise 2-D and 3-D shapes in different orientations and describe their properties
• Use standard units to measure and relate units to intervals on a scale

Year 3
• Partition two and three digit whole numbers (integers) into units and powers of 10 and in other ways
• Carry out calculations for addition and subtraction using mental (HTO + TO) and written methods (HTO + HTO) and known facts (number bonds)
• Know multiplication facts for 2, 3, 4, 5, 8 and 10 times tables.

• Multiply one and two digit numbers by 10 and 100
• Recognise unit fractions as part of a whole divided into equal parts and name and identify fractions
• Measure and record using metric units, identify and use right angles to compare angles
• Draw and interpret bar charts and read partially numbered scales

Year 4
• Use decimal notation for tenths and hundredths and partition decimal numbers
• Recall multiplication facts for all tables up to 12 x and derive related division facts
• Multiply and divide two-digit numbers by one-digit number using mental and written methods (short division) including division with remainders
• Find fractions of quantities using division and multiplication; compare and order related fractions
• Visualise shapes and interpret drawing of them; use decimal notation to record measures
• Interpret scales, read and extract information in tables and charts
• Read time to the nearest minute

Year 5
• Identify the value of each digit in numbers with two decimal places and use to multiply and divide by 10, 100 or 1000
• Establish whether a number up to 100 is a prime number and recall prime numbers to 19
• Carry out calculations for all four operations using mental and written calculations (ThHTO x TO, ThHTO ÷ O, long x and short ÷)
• Find fractions and percentages of numbers and quantities, scale numbers up or down
• Measure and record using the full range of standard/metric units, draw shapes, use the coordinate system and measure angles
• Interpret on partially numbered scales, read timetables and draw line graphs to show changes over time

Year 6
• Recall rapidly addition and multiplication facts and apply to calculations involving all four operations including: decimals, fractions and percentages
• Calculate mentally with whole numbers and numbers with one decimal place; calculate simple percentages of whole numbers
• Use the column method for all written calculations (+, -, x, ÷)
• Express relationship between numbers and quantities as a fraction, percentage or ratio; add and subtract fractions with like denominators
• Measure using standard metric units, compare readings on different scales, convert between units
• Organise and analyse data in tables, graphs and charts and describe trends and relationships

Repetition and consolidation

The White Rose Planning sees Place value, number and calculations covered at the start of the academic year in all year groups with the exception of Year 1 where these units are revisited during spring and summer terms. As a result, it is important that these skills are revisited either through starters or plenaries.

Management of Mathematics at Holyport CE Primary - Roles and Responsibilities

Role of the Subject Leader

- Ensure progression in attainment from all year groups
- Monitor planning, teaching and assessment
- Teach demonstration lessons when appropriate
- 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 Headteacher
- Work co-operatively with the SENCO
- Observe colleagues, when appropriate, with a view to identifying the support they need
- Purchase mathematical equipment that will raise attainment;
- Attend INSET provided by ODST, RBWM, Local Maths Hubs and feedback important information to staff
- Analyse children's test results to measure attainment and improve mathematics within the school
- Inform and support parents
- Conduct an annual review of mathematics and the production of a report for the governors

Role of the Standards and Staffing (S&S) Committee (and named Governor for Maths)

- Visit the school regularly to talk with the teachers and when possible, observe some of the daily mathematics lessons
- Report back to the S & S Committee on a regular basis
- Attend any relevant inset or training

Role of the Head Teacher

- Lead, manage and monitor the implementation of the framework, including monitoring teaching plans and the quality of teaching in the classrooms
- Ensure that mathematics retains a high profile in the school's development work and actions identified in SDP are effective in raising standards
- Deploy support staff to maximise support for the framework.

The '99' Club

The aim of this weekly scheme is to raise standards in maths through encouraging pupils to improve their mental calculations using all four operations. This will increase their speed and confidence in tackling mental maths problems in lessons, the curriculum and in day to day life. It is not a 'club' in the after school club sense, but a scheme which takes place at school. Teachers are expected to identify a dedicated slot on their timetable where they will give the children time to complete that week's assessment or practice sheet.

The club begins in Year 1 with an "11" club and children will work their way up, having one opportunity per week to answer all calculations at their current level unaided (including use of multiplication grids, hundreds square or adult help) and within the allotted time of ten minutes. If all of the calculations are answered correctly, the child can move up to the next level.
There are 9 levels plus an additional 4 challenge levels. Pupils keep progressing through the "clubs" until they have completed the "Platinum" Challenge. On entry in Year 1 each child will be issued with a '99' Club passport that remains in school and progress through the scheme is recorded in this. The passport moves through the year groups with the pupil.

Pupils are able to practice at home using practise sheets which will be available on the website. These are different from the sheets used in school. Also on the website you will be able to find details about what is included in each "club" so you can encourage and support your child at home.

Times Table Rockstars

We bridge the gap between working on paper for the 99 club and completing the Multiplication Check electronically using Times Table Rockstars (TTR). All pupils have a log in and are encouraged through homework tasks and 'Battles' to engage with this app. The platform has many different activities which encourage speed of recall of table facts. When pupils first log on they are assessed using the 'Garage' area and once completed they work through levels which are specifically designed to target the next stage/table. In addition to the graduated approach of the Garage pupils can generate their response time using the 'Studio' and there are three levels which are rewarded with certificates and badges: Rockstar has a response time of under 3 seconds, Rock Legend has a response time of under two seconds and Rock Hero has a response time of under one second. The third area to use is the 'Sound Check' this has 25 questions of mixed tables and allows the pupil six seconds to answer. All three areas provide valuable data on pupils' multiplication knowledge for teachers to identify areas to target. TTR is used by teachers to generate 'Heat Maps' which are sent home to parents each short term. The Heat maps are colour coded by their response times so that parents can see which tables their children know well and which need to be practiced and focused on at home.

The National Multiplication Check (MTC) - Year 4 only

The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided. It is an on-screen check consisting of 25 times table questions. Your child will be able to answer 3 practice questions before taking the actual check. They will then have 6 seconds to answer each question. On average, the check should take no longer than 5 minutes to complete.

The check is marked out of 25, with no pass mark – however at Holyport, we will use this information to inform any additional support that might be needed.

Display

We recognise the importance of displays in the teaching and learning of mathematics. Every class displays relevant mathematical information on their 'Math's Working Wall' which is consistent throughout the school. This is appropriate to the age-expectations of the class. These may include number lines, number grids, vocabulary and other display materials that provide a visual support for the children's mental and written processes.

Academically More Able Children

More able/higher attaining children will be taught with their own class or set and stretched through differentiated group work and extra challenges. When working with the whole class, teachers will direct questions towards the higher attainers (at their ability level) to maintain their involvement. In addition, children in Years 5/6 will have opportunities to demonstrate their skills through schemes such as the 'Primary Maths Challenge' or 'Quiz Club' and they may receive extra 'booster groups' at the higher level to ensure that they are reaching their potential.

SEND Children

Within the daily mathematics lesson teachers aim to provide activities to support children who find mathematics challenging. Children with SEND are taught within the daily mathematics lesson and are encouraged to take part when and where possible. Where applicable teachers will incorporate suitable objectives from the National Curriculum and White Rose Maths and teachers keep these objectives in mind

when planning work. When educational support staff are available to support groups or 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. SEND children also have the opportunity throughout the year to take part in appropriate Intervention programmes that support them further, fill in any gaps in their understanding and enable them to reach their full potential

Expectations for presentation in mathematics

Key Stage 1/Early Years

Stickers to show short date, LO and Success criteria for variable fluency and problem solving and reasoning stuck in books.
Indication whether the work was independent (I) or aided (A)
From Y1 upwards – one digit per square
Only pencil should be used in maths books
If sheets are used then they are trimmed to fit the page of folded in half before being stuck into book.

Key Stage 2

Stickers to show short date, LO and Success criteria for variable fluency and problem solving and reasoning
Margins drawn with a ruler
Page split into 2 vertically with a second margin with calculations on left sides as appropriate and corrections to the right of the second margin.
One digit per square
Only pencil should be used by pupils in maths books
If sheets are used then they are trimmed to fit the page of folded in half before being stuck into book.

Assessment including Marking and Feedback in Mathematics

We aim to provide feedback to children through marking so that they have specific advice about improvements to their work. Children are given time to read and review their work following marking.

All staff should use a green pen and model clean and legible writing when marking work. Any scaffolding within the lesson should also be carried out in a green pen with VF (verbal feedback) used to show that verbal feedback was being given.

If a question has been answered correctly a tick should be given. If the answer is incorrect it should be marked with a green dot and the error in the calculation could be circled. Time should then be given for the pupils to respond to marking and to make corrections.

Successes are celebrated with a Wow comment. This should be specific about the concept, calculation or strategies being taught in the lesson. Next Steps (Now comment) should be identified – this may take the form of repeating a calculation to ensure understanding, reasoning about an answer given, applying the knowledge to a different situation, answering a word problem or being given the opportunity to reflect on errors. The 'Now' should be specific and not general and should allow the pupil to reflect on specific errors or make progress in their application.

Staff may choose to use stamps and/or stickers to comment on effort of children (e.g. well done, good effort etc.).
Children should be given opportunities to self and peer mark as well as carry out self-assessment on the topic or concept that has been covered.

Assessment

Teachers also use a variety of formative assessment methods e.g. quizzes, correcting mistakes, teach the teacher, identifying misconceptions etc.
They also use White Rose Termly Assessments, CGP and other summative assessments to support their teacher assessment of each child's progress through the Target Tracker Steps.
At the end of each long term pupils will undertake NFER assessments. These allow us to generate standardised scores for pupils and the staff produce gap analysis data to identify concepts that pupils need to revisit. These are then planned in as mental oral starters in the next term. This overlearning allows pupils to 'close the gap'.
Teachers track children's progress using the school assessment software 'Target Tracker'. The children's work is assessed half termly against statements and then teachers use this to agree the 'step' achieved. The expectation is that children will make a minimum of 6 Steps over a year. Each child is given an individual target to be achieved at the end of the academic year. The targets are challenging and are aimed to ensure that each child reaches their full potential.

Reporting

All parents receive an interim and end of year written report. The interim report allows the parents to see their child's effort and attainment as well as their predicted outcome for the end of the academic year. Their full annual report gives a summary of their child's effort and progress in mathematics over the year. The children contribute to this by identifying their own successes and challenges throughout the year.

At the end of KS1 and KS2, each pupil's level of achievement against national standards is included as part of their annual written report

Spiritual, Moral, Social and Cultural Development

The teaching of mathematics at Holyport supports the social development of children through collaborative learning. Children are often grouped so that they can work together and they are given a chance to discuss their ideas and results. The study of famous mathematicians around the world and historical methods of the number system and calculating, contributes to the cultural development of our children. Mathematics contributes to children's spiritual development - children can find shapes and pattern in nature. They can see the order, logic and pattern that numbers offer. Opportunities for moral development are also offered – children are encouraged to discover how logical reasoning can be used to consider the consequences of particular decisions and the value of mathematical truth.

HOLYPORT CE PRIMARY SCHOOL & FOUNDATION UNIT	
Date policy adopted and signed by LGB: July 2022	Name and signature of Governor/ Chair of Governors: Paul Mew *P Mew*
Name of Head teacher: Amanda Featherstone	Signature of Head teacher: *A. Featherstone*
Date to be reviewed: July 2025	This policy will be subject to review every three years by the Governing Body or more frequently in the light of changes in legislation or advice from the ODST/LA.