Hellingly Community Primary School

Maths Policy

Approved by: **Date:**

Last reviewed on:

Next review due by:

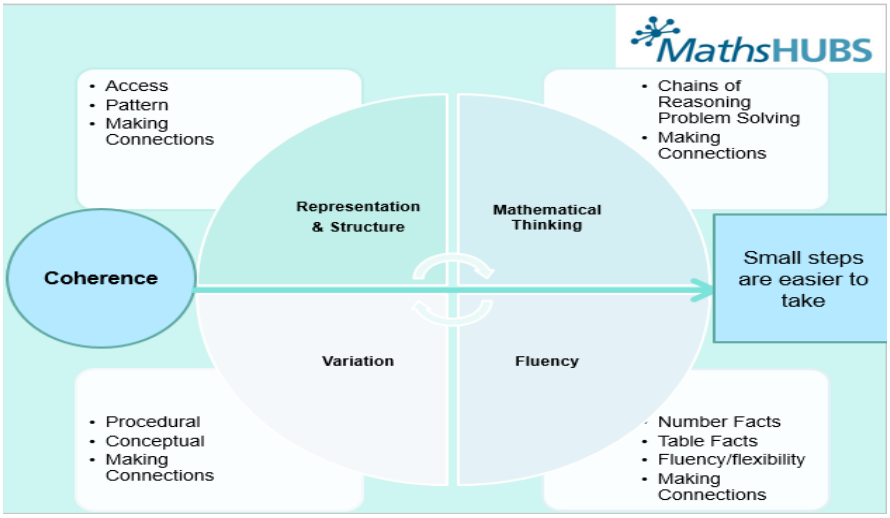
Hellingly School Maths Policy

This document is a statement of the aims, principles and strategies for the teaching and learning of Mathematics at Hellingly School in accordance with the National Curriculum 2014.

At Hellingly, we are continuing our exciting journey in embedding Teaching for Mastery in maths. We are committed to provide the very best maths teaching so we can make a difference to every pupil. We value the importance of teaching approaches that enable our pupils to secure a deep understanding of mathematical concepts along with a varied fluency in applying them.

Our Teaching for Mastery Curriculum is influenced and inspired by leading maths researchers, White Rose Maths. At Hellingly, our vision is to 'Reach for the Stars'. Our teachers strive to deliver both depth and breadth and ensure that our pupils grasp the fundamental concepts that unlock the door to mastery. Our pupils are actively involved in the learning process as we want all of them to develop a love of maths, along with a 'can do' attitude on their lifelong learning journey. Along with our core values, this will enable them to persevere with the determination to achieve their full potential when faced with a challenge and have a positive attitude to making mistakes and seeking solutions. At Hellingly, we strive to ensure that learning is a rewarding and enjoyable experience.

The Big Picture



Coherence

Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

Representation and Structure

Through the use of concrete and pictorial approaches, maths is accessible to all children, enabling them to see patterns and make connections. These experiences develop the pupils confidence in mathematical understanding so they see the relevance of mathematics in the outside world.

Mathematical Thinking

The children are given opportunities to communicate through discussion with their talk partners, following the chain of reasoning and making connections. This enables them to further develop their conceptual understanding and verbal reasoning. This also ensures that pupils have an in-depth knowledge of mathematical vocabulary and its meaning. The children are also able to make links within maths and other areas of the curriculum.

Fluency

Quick and efficient recall of number facts is important to ensure the children are able to confidently move between different contexts and representations of mathematics.

Variation

The children are exposed to different representations of the concept being taught to ensure that they have a sound understanding. This then enables the children to use and apply what they have learnt in a variety of ways, in a range of contexts.

Mastery and Mastery with Greater Depth

Within the terms mastery and mastery with greater depth, all children require depth in their learning and understanding. All children should be given the opportunities to develop their ability to:

- Use mathematical concepts and facts and procedures fluently.
- Recall key number facts with speed and accuracy and use these to calculate unknown facts.
- Use understanding to reason and explain a mathematical problem.

Children working at mastery can:

- Describe in his/her own words.
- Represent their learning in a variety of ways - concrete, pictorial and abstract.
- Explain it to someone else.
- Make up his/her own examples.
- Make links and see connections between facts, ideas and patterns etc.
- Recognise it in a new context.

Children working at mastery with greater depth can:

- Solve problems of greater complexity (where the approach is not immediately obvious) and they can demonstrate creatively in their approach.
- Independently explore and investigate mathematical contexts and structures.
- Communicate results clearly and systematically.
- Explain and generalise about mathematics.

The Concrete, Pictorial and Abstract (CPA) Approach

At Hellingly, we use the CPA approach because we believe that the children's conceptual understanding and fluency is strengthened if they experience different representations of a concept. Moving between these approaches enables the children to connect abstract symbols with familiar contexts, which supports pupils in making sense of maths.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

What is the intent of Hellingly's maths curriculum?

Our overall, long-term aim is to produce a connected curriculum accessible to all pupils, in all classes. We aim to support pupils becoming fluent in the fundamentals of mathematics, namely, be able to reason and problem solve. These skills are crucial life skills for our pupils and will enable them to be successful adults in the work place.

In order to gain confidence in these life skills pupils MUST be able to visualise the maths and we support them to do this through the CPA approach. This helps children to understand mathematical concepts and make links and connections with different representations of the same thing.

We also place emphasis on mathematical language and questioning so pupils have the tools to discuss the mathematics they are doing. As well as being fluent mathematicians, we want pupils to love maths and experiment with their ideas through a series of mathematical challenges.

Curriculum progression maps

National Curriculum Progression

Years 1 to 6

Why is Hellingly's Maths Curriculum ordered in this way?

To learn mathematics effectively, some concepts have to be learned before others, E.g. place value needs to be taught before addition and subtraction and addition needs to be taught before multiplication as a model of repeated addition.

There is a huge emphasis on carefully ordered number facts first throughout the curriculum but we do stress the importance on pupils receiving a broad and balanced mathematical curriculum that includes shape, measures, statistics, ratio etc where this variety of mathematical experience is threaded through other stands.

The progression map provides a clear overview of the whole of the primary phase so teachers and leaders can clearly see how topics develop over time. The aim of progression maps is to guide teachers on how the White Rose Maths curriculum links to the Key Stage 1 and Key Stage 2 National curriculum and how it progresses through the topics. The curriculum is broken down into key areas and for each area, teachers can see which National Curriculum objectives are covered in a particular year group, together with the term and block in which the objective is first met. They are also able to see what has been covered in previous year groups and where the learning journey of a particular block is heading.

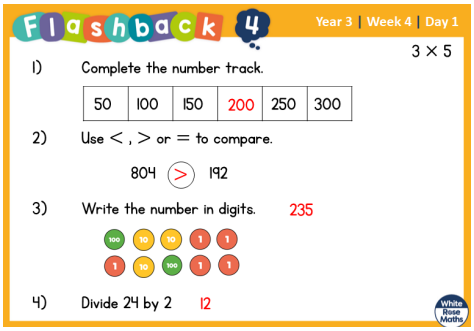
An example of a progression map

Primary Progression – Place Value

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • Count numbers to 100 in numerals; count in multiples of twos, fives and tens **Autumn 1 Autumn 4 Spring 2 Summer 4**	• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward **Autumn 1**	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number **Autumn 1 Autumn 3**	• count in multiples of 6, 7, 9, 25 and 1000 • count backwards through zero to include negative numbers **Autumn1 Autumn 4**	• count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • count forwards and backwards with positive and negative whole numbers, including through zero **Autumn 1**	
Place Value: Represent	• identify and represent numbers using objects and pictorial representations • read and write numbers to 100 in numerals • read and write numbers from 1 to 20 in numerals and words. **Autumn 1 Autumn 4 Spring 2 Summer 4**	• read and write numbers to at least 100 in numerals and in words • identify, represent and estimate numbers using different representations, including the number line **Autumn 1**	• identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words **Autumn 1**	• identify, represent and estimate numbers using different representations • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value **Autumn 1**	• read, write, (order and compare) numbers to at least 1 000 000 and determine the value of each digit • read Roman numerals to 1000 (M) and recognise years written in Roman numerals. **Autumn 1**	• read, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit **Autumn 1**

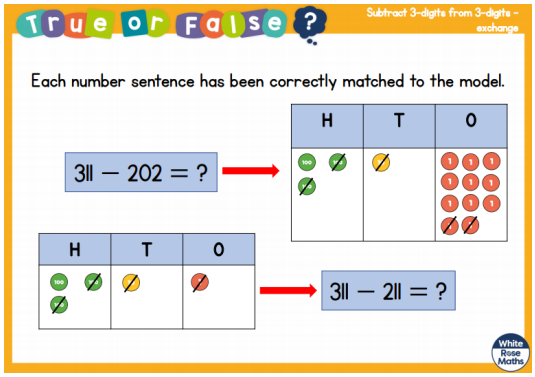
When are topics revisited?

The curriculum is cumulative so once a topic is covered, it is met many times again. For example place value is always taught in Autumn 1 but revisited in addition and subtraction, multiplication and division etc. At Hellingly, we also use 'Flashback Four' and 'True or false?' resources to support our teachers with spaced out repetition of key topics.
Flashback 4 is a series of quick questions covering something from the previous lesson, last week and then topics from earlier in the year or the previous year.



True or False

These activities encourage recap and discussion on previous learning.



Planning

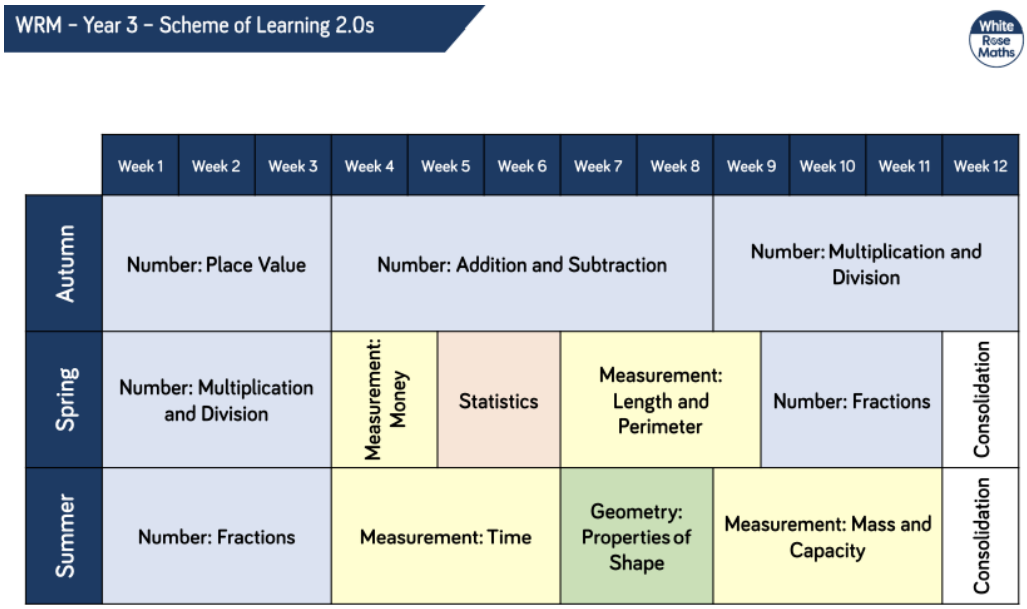
To ensure continuity and progression, teachers plan for mathematics using the White Rose Maths yearly planning overview. This is not a scheme and must be adapted to the needs of the class. Teachers should consider the children's prior knowledge and pitch expectations accordingly.

- All teachers plan to teach for Mastery, using the White Rose resources including: the White Rose Scheme of Learning and the corresponding premium resources.
- Teachers must use the agreed planning format.
- Follow the maths policy along with other policies/documents, which work in conjunction with it (Calculation Policy), when planning each lesson.

- Maths is planned for everyday – 5 lessons of maths per week. Four lessons a week follow the White Rose Maths. The fifth lesson is a fluency and revisit lesson. In this lesson there is a focus on fluency practise and the four operations as well as revisiting concepts previously taught that the teacher has identified through their formative and summative assessments.

Long Term Planning

At Hellingly, we follow the White Rose yearly block planning overview. See the Google Drive-Maths.



Medium term plans

Each year group will plan blocks of learning using White Rose topic blocks and curriculum progression maps. Each year group has a termly overview of blocks that are broken down into weeks.

When planning, teachers need to consider coverage that is broadly based on the needs of their class and keeping them on the journey together. For example, if the class needs to spend more time on fractions, then teachers have the autonomy to make that decision and move with fluidity through the White Rose blocks.

Short term plans

Short term (weekly) planning must be completed on the agreed planning format and be available for the subject leader to view at the beginning of each week.

What does the 'Teaching for Mastery' look like at Hellingly?

Lesson Structure

Each maths lesson is 60 minutes long.

Fluency

The lesson begins with a 10 minute focus on fluency using resources such as counting sticks. All the pupils are involved and engaged in improving their rapid recall of number facts.

Hook

Each teaching session starts with a hook to engage the children in mathematical discussions with their talk partners. All pupils have access to concrete manipulatives and pictorial resources (printed pictures or those drawn by themselves) to deepen their understanding before abstract methods are introduced. Our Pupils use the resources to support them in the representation of the maths and to reveal the maths behind a concept. The pupils then share their method to calculate the answer with the class.

Teaching is episodic (ping pong questioning back and forth) which provides an opportunity for teachers to use deeper questioning and check pupils understanding as they go along. E.g. Can you explain? What did you notice? Can you compare? What is the same/different? How do you know? Can you prove it? What is the odd one out? True or false? This also supports rapid interventions of misconceptions. The pupils are given lots of opportunities to explore how answers to the hook and challenges were obtained, why the method or strategy worked and what might be the most efficient method/strategy to use. Reasoning forms a key part of every mathematics session. Pupils will use and apply the skills practiced during the hook task to a varied context or problem to deepen their understanding.

All pupils should be using stem sentences. E.g. I noticed, I saw, If, I agree because, I disagree because, I think etc. We expect pupils to use mathematical vocabulary and full sentences to discuss their mathematical ideas. *E.g. T: What is 5x2? C: I know that 5x2 is 10. The quality of the pupils conceptual understanding and reasoning is enhanced, if they consistently use the correct vocabulary and explain their ideas by using complete sentences.*

The Learning Intention isn't introduced by the teacher at the start of the lesson but developed by the class based on their understanding of what they are learning. (This is done after the hook task). *What have we been learning about so far?* The children then agree on the 'I have been learning' learning intention for the lesson, to later use in their journals.

Consolidation KS1

After the task, children in KS1 will have an activity, which may be differentiated, to complete. This could be further practical work or work with a written element recorded in their maths journals. The Learning Objective is recorded in their journals by the teacher.

Consolidation KS2

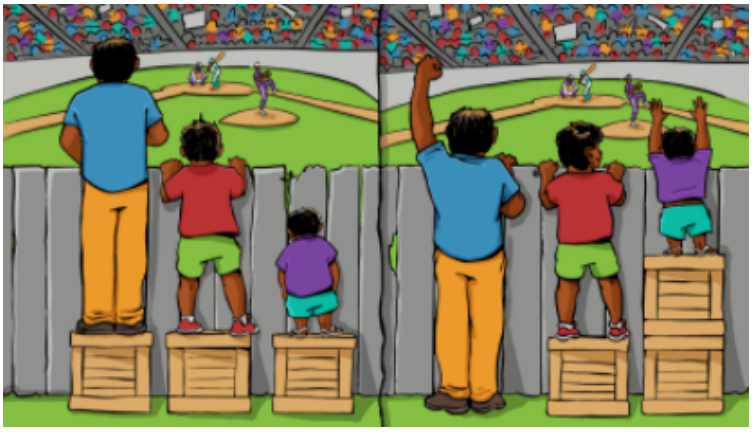
After exploring the focus of the lesson through the hook. All children in KS2 complete a consolidation task. This part of the lesson enables the children to consolidate their learning and practise using the maths concept, e.g practising the method of using column addition before moving onto using and applying in an abstract challenge. The pupils always have access to the concrete manipulatives for support.

The consolidation task may be using some of the White Rose Premium resources or completing some questions in their maths journals. This enables the teacher to identify any misconceptions and put support in place where it is needed. Consolidation tasks can be differentiated to meet the needs of the class from scaffolding the task for those who need to overlearn the maths concept, to enabling others to quickly move onto challenges requiring deeper thinking.

Challenge

Each lesson has a challenge element to broaden and extend pupils of all abilities. These abstract challenges enable children to use and apply the concept they have been learning and explore it in greater depth. All children are exposed to solving problems and the rich discussions and mathematical language that is used. The challenges have a blue border and are neatly stuck into the journal for the children to then complete. The children are encouraged to show and explain their thinking, drawing pictorial representations where appropriate as well as recording their method.

Differentiation



Differentiation is provided through the level of time and support a child needs. We are working to reduce differences in attainment for our lower attaining learners, whilst at the

same time offering rich mathematical opportunities for all. Additional support may be provided in the following ways: further use of equipment to expose the structure of the maths, a scaffolded task to support the children in achieving the learning objective or careful directed questioning and class teacher guided, adult support. (All staff have access to the Quality First Teaching Document for guidance in giving differentiated support.)
SEND Pupils who are working significantly below the year group objectives are supported by the teacher or TA within the year group on targeted objectives to close the gap.

Journal Page

During each unit the children will have time to create a 'Journal Page'. On their journal page they can demonstrate their understanding of the maths concept they have been learning about. A journal page should include pictorial representations (where appropriate), an explanation about how to do the maths –with some examples and links to where they might use this in a real life context.

Whole Class Problem Solving and Reasoning Lessons

Within a maths block, the class teacher may choose to have a reasoning and problem solving lesson. In this lesson, the whole class work on using and applying their knowledge, understanding and skills to solve the same problem (with the appropropriate scaffolding to enable all pupils to access the learning.)

Maths Journals and Folders Presentation Expectations for KS1 and KS2

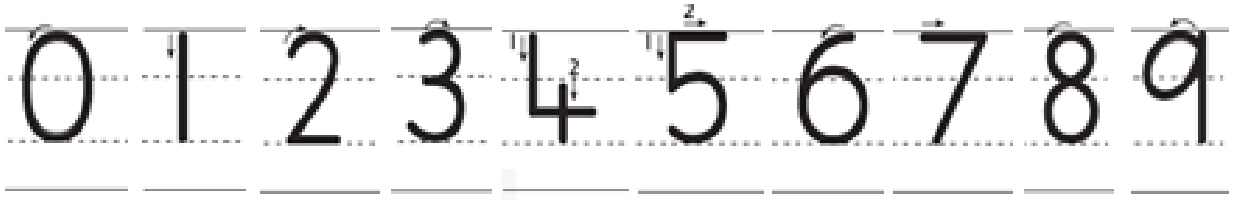
- Must be clearly and neatly labelled with the name of the pupil, the subject and class.
- Pupils should present work clearly and neatly.
- All work must be dated with the short numerical date.
- A learning objective or appropriate title on a sticker for KS1 and for KS2 it is developed and agreed upon by the whole class after the hook. It should reflect the pupil's interpretation of the learning taking place.
- Annotated photographs are acceptable evidence of learning.
- Rulers must be used for all straight lines where the child is able to use one.
- Completed work should be ruled off ready to start a new piece.
- Morning work can be included in the maths folder.
- Work will be marked in accordance with the Hellingly School Feedback and Marking Policy.
- The pupils must be given the opportunity to edit any work in the following lesson, using their blue edit pen.
- If a child is absent this should be recorded with the date when marking is done.
- Handwriting must follow the Nelson Handwriting letter formation.

Register Activities (morning Work)Every day, the pupils have a maths morning task to complete during registration. These activities can include recapping on previous learning

(teacher assessments can be used to plan these), number of the day, White Rose Flashback 4 and true or false activities. This work can be completed on whiteboards, or where appropriate on a worksheet that can be kept in the pupils maths folders.

Number Formation

At Hellingly, we follow the Nelson Handwriting scheme when learning the formation of numbers. Each digit is is formed following these formations:



If a pupil in any year group incorrectly forms numbers in their work this needs to be highlighted through marking and addressed. (See the Effective Feedback and Marking Policy) They must have support and opportunities to rehearse the correct number formation.

Numbots and Times Table Rock Stars - Home Learning

Numbots is used by the children in Reception, KS1and SEND children. It is an online game with the key focus to improve the pupils recall and understanding of number bonds and addition and subtraction facts

Times Table Rock Stars is used by some children in Year 2 and the whole of KS2. 9It is an online game with the key focus to improve the pupils fluency of the times table facts - including multiplication and division facts.

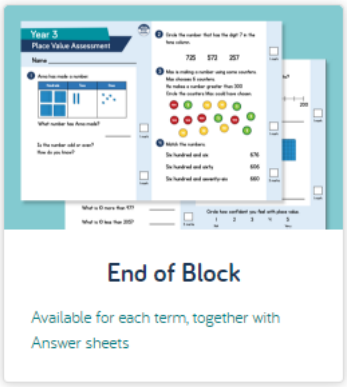
The expectation is for pupils to play on Numbots or Times Table Rock Stars each day. The teachers are able to track and monitor the pupils progress. At the end of each term the Times Table Rock Star trophy is awarded to a pupil in the class. This award is not given to the pupils who know the most tables or have the quickest recall times. It is given to a pupil who has made significant progress for themselves and their ability.

Assessment at Hellingly

Teachers record formative assessment against the National Curriculum objectives using Target Tracker. Our assessment system allows teachers to identify underachievement and gaps in knowledge and understanding.

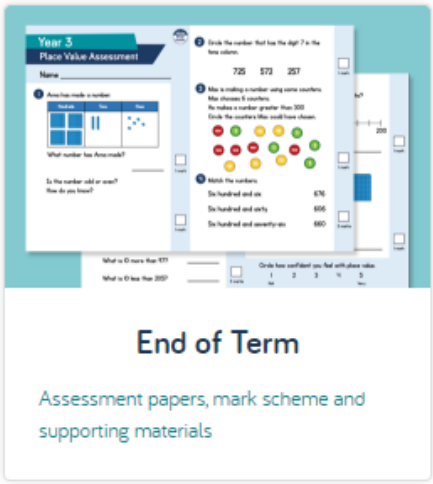
To support teachers check progress of block content knowledge pupils take an end of block assessment. These progress checkers reflect SATS papers so children from year 2-6 have a consistent approach and a familiarity to the formal assessments they take.

Example of end of block assessment



In addition, pupils also take an end of term progress check, where pupils are provided with an arithmetic paper and a reasoning paper. The end of block and end of term assessments support teacher assessment by working alongside our whole school Target Tracker assessment system, which is updated three terms per year.

Example of an end of term assessment



What should maths Working walls look like at Hellingly?

Each class must have a maths working wall. For each White Rose block, teachers should have the current and relevant vocabulary and concrete, pictorial and abstract methods on display so that children can refer back to previous learning or key concepts.

Ideas for a maths display include:

- Key vocabulary for the block
- Symbols
- Number lines
- 100 squares
- Multiplication squares
- Pupil's work
- Images of CPA
- Questions to answer or research
- Stem sentences
- Problems to solve

The working walls must reflect the current White Rose planning and be built up over time with the children.

Maths equipment

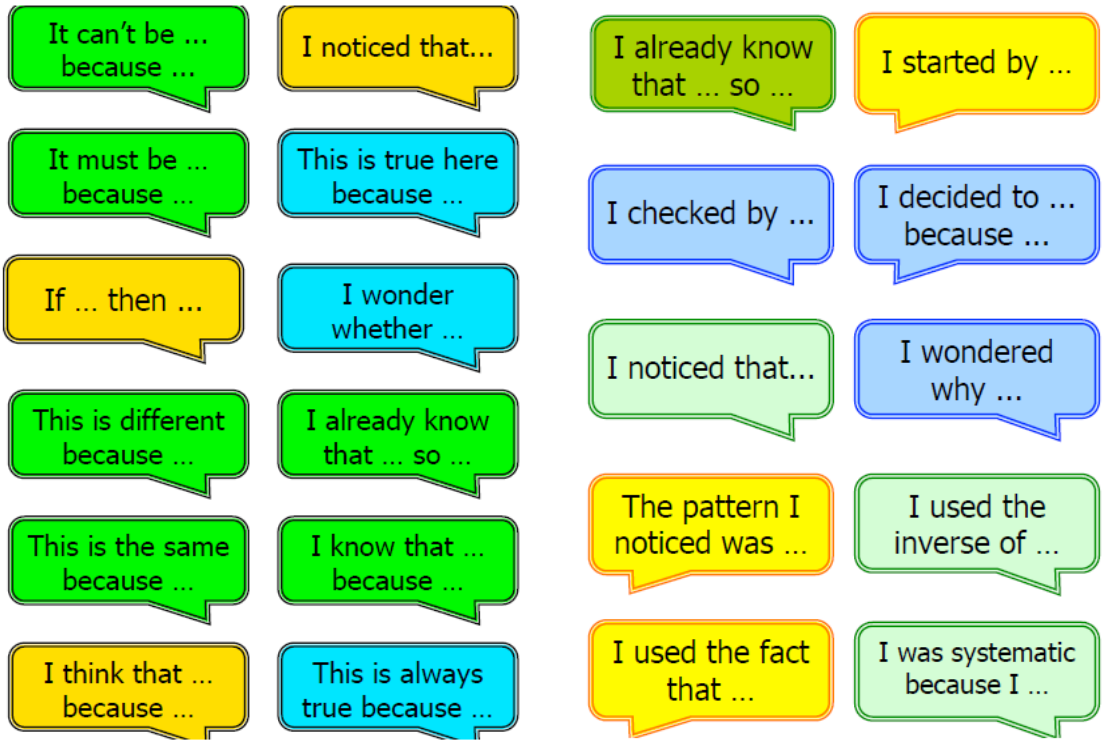
Al classes should have a maths equipment table/area in class or in the shared area and resources should be clearly labelled.

Maths resources should include:

- Numicon
- Place value counters
- Base 10 or Dienes Apparatus
- Number lines
- 100 squares
- Multiplication squares
- Bead strings/dice
- Key mathematical vocabulary linked the objectives being taught.

Stem questions:

Stem questions must be displayed on the maths working wall and each pupil should have a stem question mat available to them at their tables. The pupils must be encouraged to use these sentence stems when talking within the class and when recording their learning.



EYFS Teaching for Mastery

Early Learning Goals in Reception

There are two Early Learning Goals for maths. This is a target or goal for children to achieve at the end of their reception year at school.

- **Number:** Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

- **Shape, Space and Measure:** Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects

and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

What does the learning look like in EYFS

Through our 'therapeutic thinking' approach to learning and behaviour at Hellingly, we encourage pupils to develop a love of learning for the subject, confidence and to understand how it is embedded within the Early years curriculum. Pupils develop Maths Mastery through exploring, talking, explaining and showing. This leads into the whole school CPA approach during the maths lesson.

We have a daily 'Maths Meeting' session where pupils are encouraged to reflect on and discuss the learning that has already taken place that week or day. They are then encouraged to learn and use appropriate mathematical language during the maths session known as 'Maths talk'.

We celebrate achievement and understanding of maths concepts by acknowledging a 'Master of Math's during the lesson to support the learning intention that we are showing that we are mastering something by talking about and showing our understanding.

All pupils have access to concrete manipulatives to deepen their understanding before abstract methods are introduced.

Enabling environments - During continuous provision time (also known as 'Getting Busy' time) the children have the opportunity to access different activities across the curriculum. The children are encouraged to apply skills that have previously learnt independently.

The Reception practitioners understand that all continuous and enhanced provision within the environment, provides a range of different mathematical teaching and learning opportunities.

Long, Medium and Short term planning

- **Long term planning:** See the Reception yearly block maths overview-

w drive/maths which follows guidance from White Rose Maths.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Term 1 *THIS IS ME!*	Baseline			Numbers: Counting and recognition.			Shape, space and measures: 2D shapes
Term 2 *SPARKLE AND SHINE*	Shape, space and measures: 2D shapes	Numbers: Counting irregular amounts	Shape, space and measures: Measuring length, height and size.		Numbers: Counting and recognition.		
Term 3 *MY FIVE SENSES*	Numbers: Counting and Recognition Addition and Subtraction			Shape, space and measures: Positional language, weight and capacity and time.			
Term 4 *SUPERHEROES & THOSE WHO HELP US*	Shape, space and measures: 3D shapes Weight and capacity		Number: Counting and recognition. Place value	Numbers: Counting and Recognition Number: Counting and recognition.			
Term 5 BUGS AND BUDS	Number: Counting and recognition.		Number: addition and subtraction.		Doubling and Halving		Shape, space and measures: 2D shapes
Term 6 TRADITIONAL TALES, DRAGONS AND MAGIC	Shape, space and measures: 2D shapes	Numbers: Doubling, halving and sharing.		Problem solving	Consolidation and Assessments		

- **Medium term planning:** Each term maths is planned for in the medium term plan. See medium term plans on drive for all terms from 1-6.

- **Short term weekly planning:** Weekly plans are created from child led observations,previous maths meeting evaluations and information from the medium term planning, including the number of the week. Each week, planning consists of whole class 'Maths Meeting' input and adult led activities. When planning, teachers need to consider coverage that is broadly based on the needs of their class and acknowledging their next steps 'in the moment' and facilitating that in the lessons and within the provision.

How do we teach for Mastery in Early Years?

Fluency

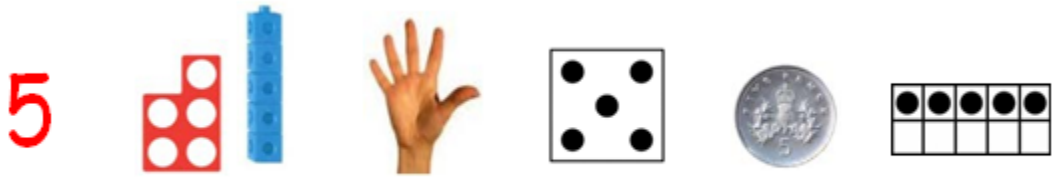
In Reception, we aim to teach maths so that children have a deep understanding of number and leave the early years mastering their understanding of number and mathematical concepts.

Representing Numbers

We want to develop children's number sense so that they understand the number and everything that it represents, rather than just recognising the numeral. Children need to understand that numbers can be represented in many ways, not just as a written numeral.

We use many different objects and pictures to show that numbers can be represented in lots of ways.

Some ways to represent five:



Children need to be exposed to and given the opportunity to practise to recognise numbers in different forms. Games involving number matching to quantity, amount recognition and making different amounts are provided throughout our indoor and outdoor provision.

Counting

When counting, children need to understand:

That we need to say one number for each object counted (touch counting).

The final number we say is how many altogether. (subitising) Some children continue to count after they have reached the final object as they don't connect the numbers they are saying to the objects in front of them.

That we can count objects in any order and the total stays the same.

Recognising amounts

Another skill that is very important is recognising small amounts without the need to count them. Initially this should be by using concrete objects such as those shown above but as children progress, allowing them to see groups of dots in different arrangements helps them to mentally 'see' how many objects are there without needing to count. This is a very important skill when children begin to add and subtract. Using dice is a good way to practise this skill before moving onto objects in different arrangements.

Understanding that the total stays the same even when the objects move

When children first start to use numbers, they often do not understand that if we move objects into another arrangement the total stays the same. We practise this with many different types of resources but a useful tool is using a tens frame to be able to move counters around.

Reasoning in Maths helps children to be able to explain their thinking, therefore making it easier for them to understand what is happening in the Maths they are doing. It helps them to think about how to solve a problem, explain how they solved it and to think about what they could do differently.

In Reception, some examples of reasoning are:

- true and false statements eg adding one to a number always makes it smaller
- spotting incorrect Maths eg 1, 2, 3, 4, 6, 5, 7, 8, 9, 10
- explaining how we know something or how we worked it out.

Problem Solving

Problem solving in Maths allows children to use their Maths skills in lots of contexts and in situations that are new to them. It allows them to seek solutions, spot patterns and think about the best way to do things rather than following Maths procedures.

In Reception, problem solving might include:

- spotting, following and creating patterns
- estimating amounts of objects
- predicting how many times they can do something in a minute
- sharing objects between different groups – particularly when the amount of groups change and the amount of objects stays the same
- finding different ways to partition numbers eg. 5 could be 5+0, 4+1, 3+2 etc.

Number of the week

At Hellingly, we follow the White Rose Maths guidance to support our teaching of Maths in reception. However, we also like to concentrate on a number a week in addition to the concepts taught that week. To start the week the children are introduced to the new number and we work on adding one more to the previously learnt number. The children are then introduced to how the number is represented, using numberblocks as a visual example and other ways. The class will then build a working wall together with a focus on the number of the week exploring different ways of making and finding the number.

Many maths skills will be taught and embedded when talking about the number of the week, including doubling and halving facts, addition and subtraction facts using the number, ways to represent the number and counting it in different ways. We do also model the formation of the number and include numeral formation in our Handwriting focus, following the Nelson Handwriting scheme.

Adult input/ group work – lesson structure

We plan for a daily 'Maths Meeting' session which is directly led by the class teacher and includes the whole class. This is where the maths learning is taught, modelled and practised with the pupils before applying in their 'getting busy' time. 'Maths talk provides pupils with an opportunity to talk about previous learning and to answer questions related to the learning that week. ' Teaching and Learning is achieved through questioning, visual representation and modelling, practising and children to be shown and encouraged how to use the maths vocabulary using sentence stems. All children have access to concrete, pictorial and abstract equipment chosen specifically by the teacher for the task.

After the whole class 'Maths Meeting' input, the class teacher will take a group of children and work on the learning and tailor the outcome to meet the needs of the pupils individual next steps.

Maths learning for each pupils is collected and shared in their learning journals and in their online learning journals, on Tapestry. Work that is collected,assessed and put in learning journals are to represent each child's progression and mastering in maths. The idea is that their learning journals show the progression that they are making in their learning and how maths feeds into their other experiences in their learning too.

Tapestry is used to gather ‘in the moment’ evidence of learning and is shared with parents. It is also a platform for parents to see where their child’s learning is and to contribute with observations and outcomes achieved at home, to give an overall picture of the child as a learner.