Maths Policy

Intent, Implementation and Impact

Ringmer Primary and Nursery School

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Intent

Our intent at Ringmer Primary and Nursery School is for all children to enjoy mathematics and have a **secure** and **deep** understanding of fundamental mathematical concepts and procedures through carefully planned sequential small steps.

We want children to see the mathematics that surrounds them every day and enjoy **developing vital life skills** in this subject. Our aim is for our children to become **flexible** and **efficient** mathematicians who can solve problems by applying their knowledge and skills of mathematical concepts, language, symbols, visual representation and logic.

We intend on a delivering a curriculum which;

- Allows all children to be a part of creative and engaging lessons that will nurture their curious minds and give them a range of opportunities to explore mathematics following a **mastery curriculum** approach.

- Builds on something that has already been sufficiently mastered – pupils' learning of concepts is seen as a continuum across the school.

- Challenges through greater depth - rather than accelerated content, (moving onto next year's concepts) teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

- Gives each child **COURAGE** to believe in themselves as mathematicians to develop the power of resilience and perseverance when faced with mathematical challenges and carefully scaffolding learning so everyone can make progress.

- Makes rich connections across mathematical ideas so that our children can take **RESPONSIBILITY** for applying links to develop fluency, spot patterns, mathematical reasoning and competence in solving increasingly sophisticated problems.

- Provides equal opportunities for children to **RESPECT** their own and each other's mathematical understanding applying these skills and knowledge to other subjects.

- Immerses children in rich mathematical vocabulary and ensures they can apply this to explain their reasoning and to justify answers.

- Enables our children to become resourceful learners who work with **COMPASSION** and co-operation with others.

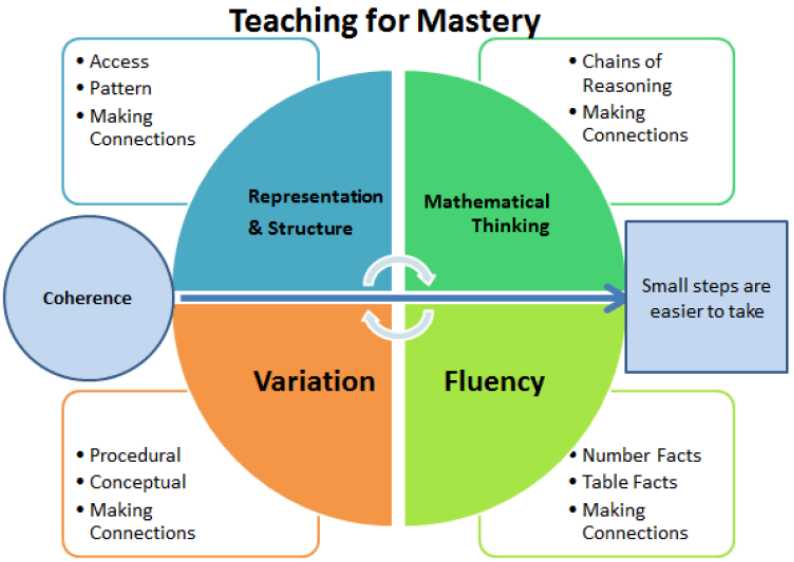
- Recognises that mathematics underpins much of our daily lives and therefore is of paramount importance in order that children aspire and are given the opportunity to excel in the next stages of their learning.

- Is in line with the expectations in the National Curriculum 2014 and the updated non-statutory guidance from the DfE (June 2020) for KS1 and KS2. The 'Ready to Progress' Criteria is utilised to prioritise key

mathematical concepts, ensuring children are secure in these concepts before moving on.

Implementation

Our teaching for mastery from EYFS to year 6 is underpinned by the NCETM's 5 Big Ideas.



1) ***Mathematical Thinking*** allow children to make chains of reasoning connected with the other areas of their mathematics.
2) ***Representation and Structure*** ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns and generalise whilst problem solving.
3) ***Coherence*** is achieved through the planning of small, connected steps to link every question and lesson within a topic.
4) Teachers use both procedural and conceptual ***Variation*** within their lessons.
5) An emphasis on ***Fluency*** with a relentless focus on number and times table facts.

We develop our children's conceptual understanding of number using **concrete, pictorial and abstract** methods. **(CPA)**

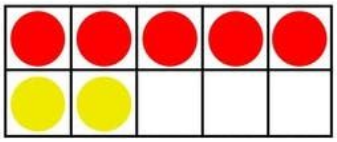
Concrete	Pictorial	Abstract
		1 + 4 = 5
Things children can touch, hold and manipulate (manipulatives)	Things children can see and draw (Visual representations)	Symbolic representation

CPA in EYFS

In Nursery and Reception we follow the Early Years Foundation Stage curriculum. Children have access to lots of concrete equipment to support their understanding of number, including counting toys, unifix cubes, Numicon,



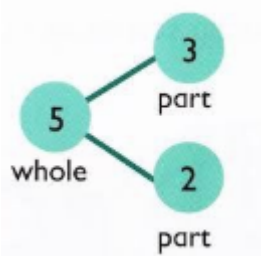
tens frames and double sided counters.



We also use everyday items such as coins, buttons, corks, food, to help children understand that maths is a part of our everyday lives.

CPA in KS1

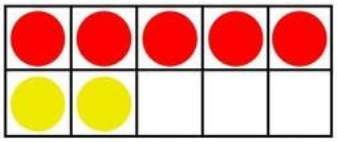
In years 1 and 2 children build on the knowledge they have gained from Reception. Children start learning about number bonds. Number bonds teach children that numbers can be split-up or combined. We use the part-part-whole model to represent this. This concept is the foundation children need to understand before they are able to add and subtract.



Once children have an understanding of the part-part-whole model, they are also introduced to bar models, which show the same relationship between numbers.



They have a variety of concrete apparatus to continue supporting their understanding of addition, subtraction, multiplication and division, including Dienes, counters, straws, unifix cubes, counting beads, Numicon, tens frames and double sided counters.

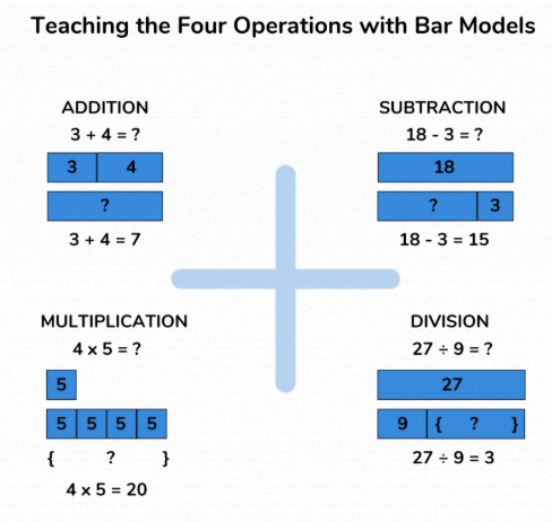


As well as understanding number, children will also develop their understanding of shape and space, measurement, fractions and statistics.

CPA in KS2

By Key Stage 2, children are becoming much more fluent with numbers and the use of the four mathematical operations (addition, subtraction, multiplication and division). Children are still taught using the CPA approach, but are able to work with larger numbers. In order to work with numbers up to 10 million and decimal numbers, the children use base ten and place value counters to support their continued conceptual development.

Children are given every opportunity to link their mathematics to "real life problems". To solve the problem children represent the problem in a bar model. It is a pictorial representation of a problem that enables children to see which operation they need to use to solve the question.



Moving on from KS1, where children handle the objects in the problem, children draw the objects in a pictorial representation. Eventually the children can draw a bar and write the numbers that the bar represents.

As the numbers and problems become more complex – the children move straight onto the bar, but concrete apparatus will remain available for children to reinforce what they are doing. By year 6, children are solving complex problems, involving ratio, fractions and multi-step problems.

Curriculum design and planning

- All of our children have a daily 45-minute maths lesson.
- Our KS2 children have a daily 20 minute fluency session.
- Our KS1 children have a daily fluency session from the KS1 mastering number.

At Ringmer Primary and Nursery School we have fidelity to White Rose. White Rose primary maths resources are designed to instil a deeper understanding of mathematical concepts using a full range of fun, inspiring classroom activities. We use programmes and resources to supplement lessons further such as: NCETM Mastery Assessment materials, NRICH, Space Learning, Diagnostic questions or Testbase as well as, visual images and concrete resources.

This ensures we meet the needs of all learners, and have a clear sequence of knowledge and skills. Knowledge and skills are applied to problem solving activities which are crafted using resources above. Our embedded lesson structure supports the application of knowledge in wider contexts every day.

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- We have fidelity to the White Rose. White Rose primary maths resources are designed to instil a deeper understanding of mathematical concepts using a full range of fun, inspiring classroom activities.
- We use programmes and resources to supplement lessons further such as:
- NCETM Mastery Assessment materials, NRICH, Space Learning, Diagnostic questions or Testbase as well as, visual images and concrete resources. The focus is on the **whole class progressing together**. Collaborative planning with year group colleagues is encouraged to ensure consistency.

- Learning is broken down into small, connected steps, building from what pupils already know. The lesson journey should be detailed and evident on Google slides or PowerPoint.

- Difficult points and potential misconceptions are identified in advance and strategies to address them planned for through pre-teaching. Pre-teaching is a timetabled slot every Monday across the whole school.

- Key questions are planned, to challenge thinking and develop learning for all pupils based on the lessons 'Scheme of learning' document.

- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.

- The use of high quality materials and tasks to support learning and provide access to mathematics, is integrated into lessons and the lesson structure.
- These may include ***NCETM Mastery Assessment*** materials, ***NRICH***, ***Space Learning***, ***Diagnostic questions or Testbase*** as well as, visual images and concrete resources.

- EYFS and KS1 use the ***Number Sense Programme*** to teach fluency in subitising and number facts. The programme's systematic approach provides a coherent sequence to develop a deep understanding of number to 10, addition and subtraction facts within 20 and calculation strategies. *(Please see the fluency section under maths on our website for the sequence of progression and the pedagogy that underpins this programme.)*

As of September 2024 EYFS and KS1 are participating in NCETM CPD KS1 mastery number.

- Opportunities for extra fluency practice (*instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts*) should be provided outside mathematics lessons. (Morning or Afternoon)

- The Ringmer Primary and Nursery School calculation policy is used to ensure a consistent approach to teaching the four operations over time.

Lesson Structure

- Fluency warm up/Assessment for learning questions (Reconnects). (5 m

- Key new learning points are identified explicitly. TBAT: (To Be Able To)

- Diagnostic questions to support teacher AFL. Teachers have an understanding of pupil knowledge in order to support individuals.

- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and ping/pong teacher to pupil discussion. (Ping pong/questioning/stem sentences/variation.)
  Procedural and Application: (Teach skills through the context of a multi step problem)

- Children **explore** then have **guided** followed by **independent** practice. (Paired Task and Main Task)

- After independent practise, children have opportunities to *apply*: Procedural and Application (Multi step problems using different contexts, reasoning, test base questions)

- The lesson ends with reflection over the key learning points and the opportunity to apply new learning to a different context, problem or challenge and a final diagnostic question to inform focus groups for teacher-led support.

Section of Lesson	Time
Reconnect Marked and misconceptions addressed	5 minutes
Explain and Example Ping pong/questioning/stem sentences/variation ***Procedural and Application (Teach skills through the context of a multi step problem)***	15 minutes
Attempt	5 minutes
Apply ***Procedural and Application (Multi step problems using different contexts, reasoning, test base questions)***	20 minutes
Reinforce and Retrieve	5 minutes
Dive deeper given at any point in the lesson to rapid graspers	

- There is regular interchange between **concrete**/contextual ideas, **pictorial** representations and their **abstract**/symbolic representation.

- Mathematical **generalisations** are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.

- **Stem sentences** are used consistently throughout the lesson on slides, working walls and applied in books to support reasoning and to explain their understanding during independent practice.

- Making comparisons is an important feature of developing **deep knowledge**. The questions "What's the same, what's different?" or "What do you notice?" are often used to draw attention to essential features of concepts.

- **Repetition** of key ideas (for example, in the form of whole class oral rehearsal of **stem sentences**, repeating to talk partners) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.

- **Formative assessment** is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding by using **Diagnostic Questions** and adjusts the lesson accordingly. **Test base** style questions are utilised in lessons so that pupils can apply their knowledge and skills to test style questions using different contexts.

- Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group **intervention**, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.

- **Pre-teaching** is used to ensure that all pupils can access the learning within the lesson and to assign competence.

- Children with additional needs access their learning in whole class lessons and teachers provide scaffolding and relevant support so they can access the same objective as their peers. For those children who are working

outside of the year group curriculum, individual learning activities are provided to the child's stage of learning.

- Rapid graspers will have access to 'dive deeper' challenges throughout the lesson so they are continually challenged to make progress.

• Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

Marking

- Marking of mathematics should be completed in line with the Ringmer Primary and Nursery School Feedback and Marking Policy.

- Teachers record a 1, 2 or 3 next to the TBAT.

- Teachers record initials of children who require further support, have misconceptions or need further challenge on a feedback and marking sheet. This is used to inform planning, same day/next day interventions and to plan any required pre-teaching sessions.

- A green dot is put next to errors and a V is recorded to show where a child has been given verbal feedback. Children are given time to act on feedback in the lesson, as part of early morning work or at the start of the next lesson.

- Children will check their calculations as the teacher models on the board or using a child's work under the visualizer. They will also peer assess each other's work and give feedback against the success criteria to achieve the TBAT.

Assessment

- Teachers utilise the 'Ready to progress' criteria and resources provided by the NCETM to assess if the children are secure with the objectives from the previous year group before starting a unit of work. This enables teachers to craft lessons that meet the children's needs and ensure that wide achievement gaps do not develop.

- In addition to the formative assessment undertaken in lessons, teachers will use end of unit and/or termly summative assessments supplied by ***White Rose or past SAT's papers*** to reinforce their judgements and provide further opportunities to identify gaps in pupil learning and tailor future lessons.

- We monitor the children's fluency progress by using TT rockstars and WhiteRose assessments as assessment tracking tools and track the times tables the children are secure in. In year 4 the children access the MTC and this will be used to inform planning.

- Teacher judgements are entered onto the school's ***Insight assessment tracking system*** in term 1,2, 3,4, 5 and 6. These data capture points are then used to inform discussions at each teacher's Teaching and Learning Conference. Progress is closely tracked, work in books moderated and provision highlighted for those children who require support or regular interventions.

- Moderation is conducted in year teams, across the school, between cluster schools and at EYFS, KS1 and KS2 moderation events. We use moderation, as well as exemplification materials, to ensure teacher assessments are accurate with parity across parallel year group classes.

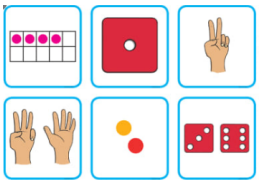
EYFS

- In the early years (Nursery and Reception), mathematics is integrated into play, whether it be in the role play area, counting games, games in the playground, access to concrete resources such as Numcion, using children's own areas of interest or singing songs and rhymes.

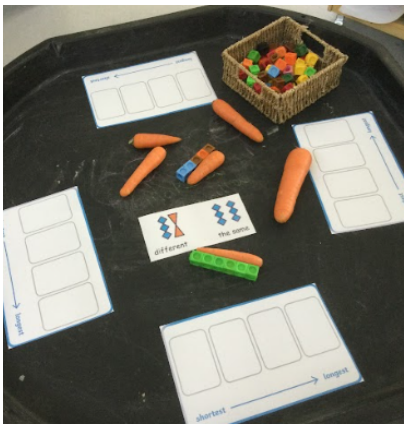
- Real life contexts are used and authentic resources so that children's curiosity is nurtured and they can make links between their learning.



- In reception children have a daily directed whole class maths session as well as short daily fluency sessions, focusing on counting, one more and one less and adding and taking away within 10. The children also practise the skill of subitising, a term that was developed by theorist Piaget and defines the ability to instantaneously recognise the number of objects in a small group without the need to count them.



- The children will also practise key skills in a small focused group. The environment is purposefully organised to enable our children to apply their understanding of key mathematical vocabulary and skills in their play. The environment is set up so that the children can access and interact with maths resources independently. Adults watch for the 'teachable moment' to support, model and scaffold to ensure progress is always being made. Through 'in the moment' play the children apply their mathematical skills in different contexts.





Working Walls

In every classroom the children's mathematical journey is displayed on a maths working wall. This is a visual scaffold of prior learning for our children. A working wall will include;

1) Small steps (TBAT's) so that the children can see the progression in their learning and how one skill builds on another.
2) Key vocabulary
3) Children's work or modelled CPA
4) Photographs
5) Stem sentences
6) Generalisations
7) Questions/challenges to deepen understanding. - Dive Deeper!



Home/School Link

- Parents are invited to an open afternoon. Our children enjoy this opportunity to regularly show their parents their mathematical work.
- 3 x a year progress report and parent consultation.
- Termly next steps for maths in EYFS.
- Weekly homework task set on Purple Mash and / or TT rockstars.
- Times tables/number bonds are on page on the website of which parents and carers are signposted to.
- Focus for weekly fluency practice on google classroom.
- Parent workshops/meetings.
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Continuous Professional Development

We have been part of a maths hub since 2019. This following diagram shows an overview of our journey so far. We are currently in our sustaining phase.



The maths lead attends professional learning sessions with a mastery specialist and then disseminates this CPD to the teachers and teaching assistants through CPD training, collaborative planning, modelling, instructional coaching and team teaching. Teachers and teaching assistants have access to training delivered from the maths hub which is chosen tailored to priorities on our maths action plan as well as individual training needs.

Impact

The impact of our intent and implementation can be seen in Developmental Drop Ins, through pupil and parent voice, book looks, learning and data pokes and our most recent Ofsted Report June 2022.

The curriculum for maths has been *'finely tuned through regular review'. (Ofsted June 2022)*

- There is a raised profile of fluency due to daily fluency sessions and the implementation of the online program Mangahigh and Number Sense. This has resulted in children demonstrating an improved confidence to quickly

recall number bonds and times table facts. Evaluation of usage levels show that the majority of our children are logging onto **Mangahigh** on a regular basis, Mangahigh is used in Sunrise, Sunset and homework clubs, to offer those children who find using Mangahigh at home a challenge to have further opportunity of this in school. We are regularly ranked in the top ten schools on the Mangahigh leaderboard and most recently came 33rd out of 400 schools in the global Mangahigh competition competing against schools from around the world.

- There is an improved attitude and resilience towards maths. This is directly seen in an increased number of children being nominated for Superstar awards for perseverance in maths linked to our school value of **COURAGE**. It was vital to develop our children's growth mindset so they see themselves as capable mathematicians. The mastery approach has enabled our children to all make progress together during the lesson and this has had the positive impact that our children are able to learn from each other and have high quality mathematical discussions.

- **Feedback from pupil voice shows that children enjoy maths, especially enrichment opportunities like participating in the last four English Maths Weeks. The pupil's voice states "I enjoy doing all the different activities like the 'Maths Party!' and the Mangahigh competition.' and 'We did an NRICH challenge where we had to add all the numbers to 100 and it took me all lesson!'**



- Our children are also proud to share their mathematical work in books during open afternoons with their parents and also during learning pokes

with the Maths Co-ordinator and Maths Link Governor. Our children are able to talk with increasing confidence about their mathematical work and show how they solved a problem demonstrating the strategy used.

- The children's maths books and working walls show the positive impact of the CPA approach. This is due to our children being able to show mathematical concepts or skills in multiple ways, using the correct mathematical language to explain their ideas. Maths books show that children can draw a range of pictorial representations and this supports deeper understanding of the abstract representation.

- DDI's and monitoring have evidenced the positive impact of the use of a range of concrete manipulatives being used across the school. From tens of frames and double sided counters to show bridging through 10 in year 1 to oranges cut into quarters when converting improper fractions to mixed numbers in year 5. We have also seen play doh being used as a supportive tool to represent fractions in year 3 and 4.

- The staggered implementation of the mastery approach across the school has resulted in each key **'Big Idea'** having a focus to ensure each element is embedded with consistency. We chose **CPA** first as this would have the greatest impact on our children's conceptual understanding. Teachers developed their subject knowledge through in house CPD led by the maths co-ordinator, attending carefully chosen courses, support from the Maths Hub TRG and using the NCTEM PD Spines to craft lessons. The impact is seen through an increase in the amount of 'good' and 'outstanding' teaching seen across the school by the Senior Leadership Team, Peer Review and School Improvement Partner. This has resulted in progress being seen in maths books during 'in house' and 'cluster' moderation.

- Rapid graspers have the opportunity to deepen their learning and are provided with tasks and challenges evidenced by '**dive deeper'** stickers in their maths books. Dive deepers are shown in diverse ways with CPD for staff on what 'Dive Deepers' look like and how they are to be used effectively. Moderation of maths books shows that children targeted for greater depth are regularly accessing these tasks.

- Moderation of books show that struggling learners and SEND children have access to scaffolds which enables them to access the same learning objective as their peers during the daily maths lesson. The majority of SEND children are making progress at the same rate as their peers.

- Every Monday across the school, children have access to 'pre teaching' sessions run by their class teachers. This is also conducted on 2 x other mornings during 'reconnect time' to ensure that children are being supported before the lesson starts, improving their confidence and increasing participation.

- Recent CPD for teachers and Higher level teaching assistants on using stem sentences, generalisations, pre teaching and focus groups delivered by the Maths Lead, has upskilled staff to support pupil's ability to reason confidently both verbally and in writing. This is seen through DDI's, book looks and pupil voice.

- KS1 and EYFS have started their journey with 'Mastering Number' with the NCETM this year. This has had a positive impact on:

- children's concept of 'number'
- Increase in hands-up/wanting to share their ideas during the main session.
- Increase in children replying using stem sentences - previously a lot of these children would have given 1 word answers.
- Engaged rather than disengaged.
- Pupil voice is positive around these sessions

- We have worked closely with a Deputy Leader of the Maths Hub - Katrina, to support us in embedding our curriculum and our pre teaching journey. She has worked with all members of staff from KS1-UKS2 in the school on planning, pre teaching and learning.

- We are seeing initial improvements in our SATs data:

	2022-2023	2023-2024	2024-2025
EXS+	67%	67%	71%
GDS	12%	13%	33%
Combined EXS	49%	50%	69%
Combined GDS	5%	4%	17%

We will continue to embed and work with our staff to support this data improvement in the future.

What's next?

- We are now working on our children independently applying a concept to new problems in unfamiliar situations. We will support our children in this by using **variation** to expose them to conceptual and procedural differences, as well as utilising **Test base,** so that pupils can apply what they know to test base questions and build further confidence to achieve expected and greater depth in summative assessments.

- CPD will be delivered to staff so they can effectively analyse answers to questions in the White Rose assessments and use this information to inform planning.

- We will continue to ensure that our children are using and applying mathematical vocabulary when using reasoning and making generalisations.

- We will embed the use of 'Pre-teaching' and 'assigning competence' strategies to ensure that all pupils can access the TBAT and grow in confidence to see themselves as mathematicians.

- Year 3 and 4 will embed the use of the counting stick to develop fluency in skip counting multiples and apply this to efficiently solving times table facts. A system to motivate and track pupil progress with the times tables is being developed.

- The maths lead will support new staff and ECT's through targeted CPD, collaborative planning and team teaching as well as utilising the maths HUB and NCETM professional development materials.

- We are very proud of our children's improved resilience but we know there is more to be done and we are developing the use of **repetition**, stem sentences, oral rehearsal and answering in full sentences so learning is rehearsed by all children and embedded.

- Embed KS1 Mastering Number in EYFS and KS1. Once this is embedded, we can continue our journey into using the KS2 Mastering Number.