Maths
Cheadle Catholic Infant School

by Elizabeth Allwright

How is learning across school sequenced?

EYFS: Curriculum

EYFS Guidance states:
Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically.
Children should be able to count confidently, develop a deep understanding of the numbers to 10, **the relationships between them and the patterns within those numbers**.
By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - **children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built**.
In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.
It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

How is learning across school sequenced?

EYFS: Curriculum (Reception)

ELG: Number
Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns
Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10.

- Celebration of maths and number in the discovery areas. Leading towards maths books.
- Progression: numbers to 10 > deep understanding of numbers > patterns of the counting system > number bonds

White Rose Maths

NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

How is learning across school sequenced?

Cheadle Catholic Infant School — Maths Overview 2022-2023

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	**Geometry** Recognising, naming and matching colours. Sorting by various attributes Continuing AB patterns **Measurement** Using the language of size **Number and Place Value** Grasping the Counting Principles Comparing amounts of objects		**Number and Place Value** Understanding number 1 Understanding number 2 Understanding number 3 Understanding number 4 Understanding number 5 Understanding number 6		**Shape and Space** Shapes **Measurement** Ordering the events of our day Length and Height Weight Capacity **Shape and Space** Positional Language	

Reception

Reception			
	Number Match and sort Compare amounts Representing 1,2& 3 Comparing 1,2 & 3 Composition of 1,2 & 3 Representing numbers to 5 One more and less **Measure, Shape ands Spatial Thinking** Compare size, mass and Capacity Exploring pattern Circles and triangles Positional language Shapes with 4 sides Time	**Number** Introducing zero Comparing numbers to 5 Composition of 4 and 5 6,7 & 8 Making pairs Combining 2 groups 9 & 10 Comparing numbers to 10 Bonds to 10 **Measure, Shape and Spatial Thinking** Compare mass (2) Compare capacity (2) Length and Height Time 3d- Shape Pattern (2)	**Number** Building numbers beyond 10 Counting patterns beyond 10 Adding more Taking away Doubling Sharing and grouping Even and odd Deepening Understanding patterns and relationships **Spatial Reasoning** Spatial reasoning (1) Match, rotate, manipulate Spatial reasoning (2) Compose and decompose Spatial reasoning (3) Visualise and build Spatial reasoning (4) Mapping

How is learning across school sequenced?

Key Stage 1 : Curriculum

The national curriculum for mathematics aims 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.

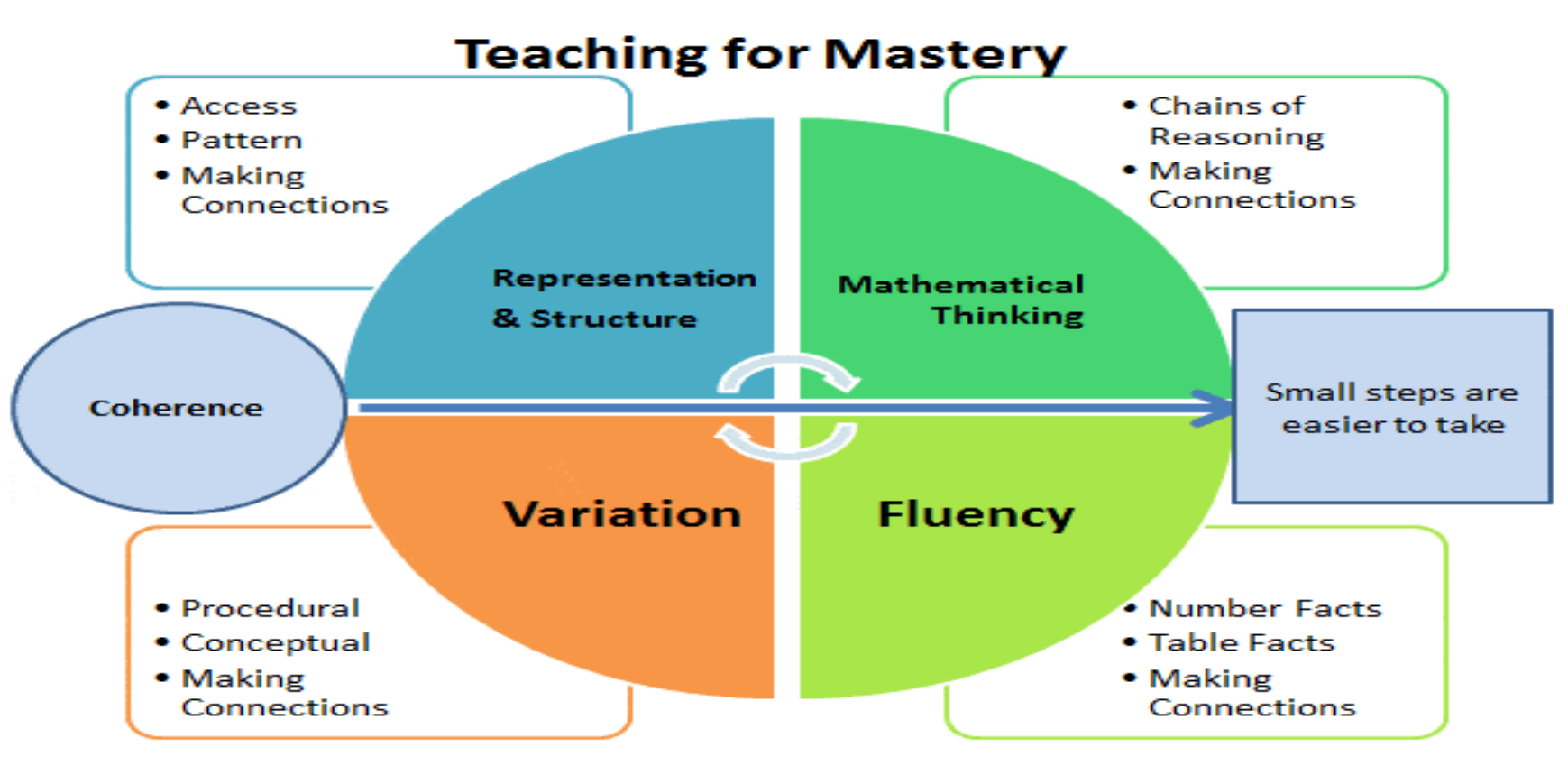
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Year 1 and year 2

Year 1	Place value Addition and subtraction within 10	Geometry – shape Number – place value (within 20)	Addition and subtraction within 20 Length and height	Place value within 50 Multiples of 2, 5 and 10 Weight and volume	Multiplication and division 2, 5 and 10 ½ and ¼ Position and direction	Number Place value within 100 Money Time
Year 2	Number: Place value Addition and subtraction	Measurement: Money Number: Multiplication and division	Number: Multiplication and division Statistics Geometry: Properties of shape	Number: Fractions Measurement: Length and height	Consolidation Geometry: Position and movement Problem solving and efficient methods. Measurement: time	Measurement: Mass, capacity and temperature Investigations

Maths Learning Cycle – KS1



NC objectives are taught within each year group and worked within our learning cycle for each unit of work.

How is learning across school

Progression of Skills Documents

Addition	National Curriculum Objective (Statutory)	By the end of the year, children should be able to…	National Curriculum Objective (Non- statutory)	Example
EYFS	Say which number is one more than a given number.	Say 1 more using numicon pieces or fingers eg: 4 6 Complete the missing number track: 1 3 4 6 7 9 10		
	Using quantities and objects, they add two single digit numbers and count on to find the answer.	Counting to add using a variety of different objects. Eg: 2 + 5 = 5 + 2 = Egg box 10 frame Use of numicon as 2 shapes to add	Recognising the biggest number in the calculation and count on from it (using objects for smaller number if necessary) 2 + 5 = Leading to 5 + 5 + 2 (without counters)	
	They solve problems	In everyday language use the vocabulary of addition Eg If I add 1 more how many will I have?	Pictorial problems where children have a go at writing the corresponding number sentence Eg 3 + 2 = 5	How many dinosaurs are there? What about if I give you two more? How many are there now?

Number: Number and Place Value

National Centre for Excellence in the Teaching of Mathematics

COUNTING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1000 000	
given a number, identify one more and one less		find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
COMPARING NUMBERS					
use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use <, > and = signs	compare and order numbers up to 1000	order and compare numbers beyond 1000 *compare numbers with the same number of decimal places up to two decimal places* (copied from Fractions)	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS					
identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line	identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		

TRIBAL

Notes and Guidance

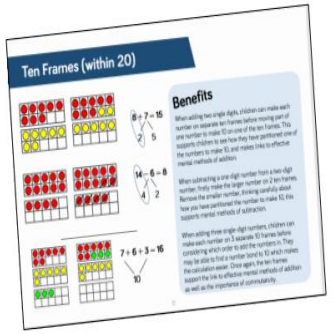
White Rose Maths

Calculation Policy

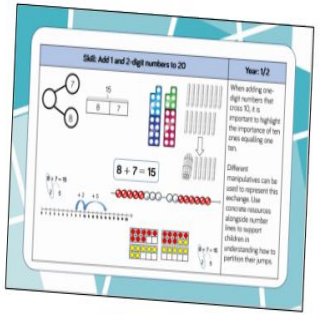
Welcome to the White Rose Maths Calculation Policy.

This document is broken down into addition and subtraction, and multiplication and division.

At the start of each policy there is an overview of the different models and images that can support the teaching of different concepts. These provide explanations of the benefits of using the models and show the links between different operations.



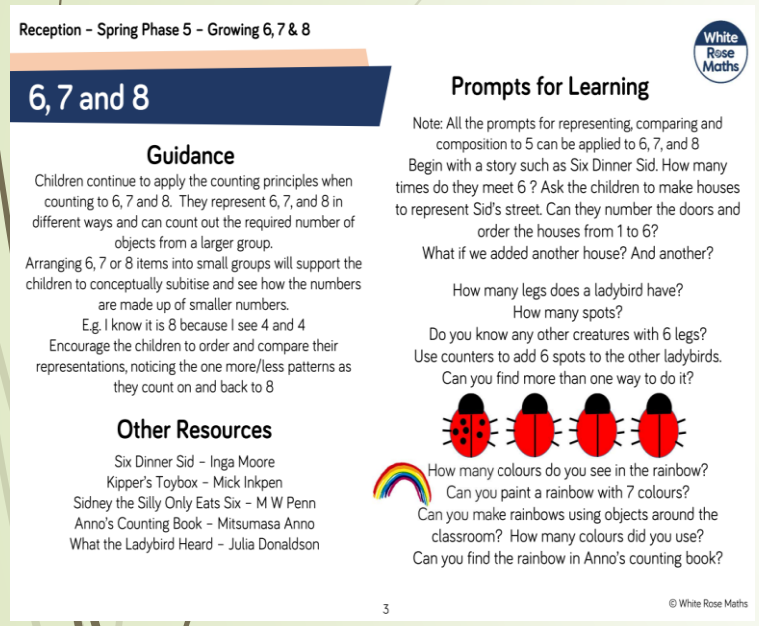
Each operation is then broken down into skills and each skill has a dedicated page showing the different models and images that could be used to effectively teach that concept.



There is an overview of skills linked to year groups to support consistency through out school. A glossary of terms is provided at the end of the calculation policy to support understanding of the key language used to teach the four operations.

Progression of skills documents from the NCETM and WRM Calculation Policies are used to guide staff to know prior learning of the children and the next steps. This informs teachers planning accordingly.

How is learning across school sequenced?



Reception – Spring Phase 5 – Growing 6, 7 & 8

White Rose Maths

6, 7 and 8

Guidance

Children continue to apply the counting principles when counting to 6, 7 and 8. They represent 6, 7, and 8 in different ways and can count out the required number of objects from a larger group.
Arranging 6, 7 or 8 items into small groups will support the children to conceptually subitise and see how the numbers are made up of smaller numbers.
E.g. I know it is 8 because I see 4 and 4
Encourage the children to order and compare their representations, noticing the one more/less patterns as they count on and back to 8

Other Resources

Six Dinner Sid – Inga Moore
Kipper's Toybox – Mick Inkpen
Sidney the Silly Only Eats Six – M W Penn
Anno's Counting Book – Mitsumasa Anno
What the Ladybird Heard – Julia Donaldson

Prompts for Learning

Note: All the prompts for representing, comparing and composition to 5 can be applied to 6, 7, and 8
Begin with a story such as Six Dinner Sid. How many times do they meet 6 ? Ask the children to make houses to represent Sid's street. Can they number the doors and order the houses from 1 to 6?
What if we added another house? And another?

How many legs does a ladybird have?
How many spots?
Do you know any other creatures with 6 legs?
Use counters to add 6 spots to the other ladybirds.
Can you find more than one way to do it?

How many colours do you see in the rainbow?
Can you paint a rainbow with 7 colours?
Can you make rainbows using objects around the classroom? How many colours did you use?
Can you find the rainbow in Anno's counting book?

3

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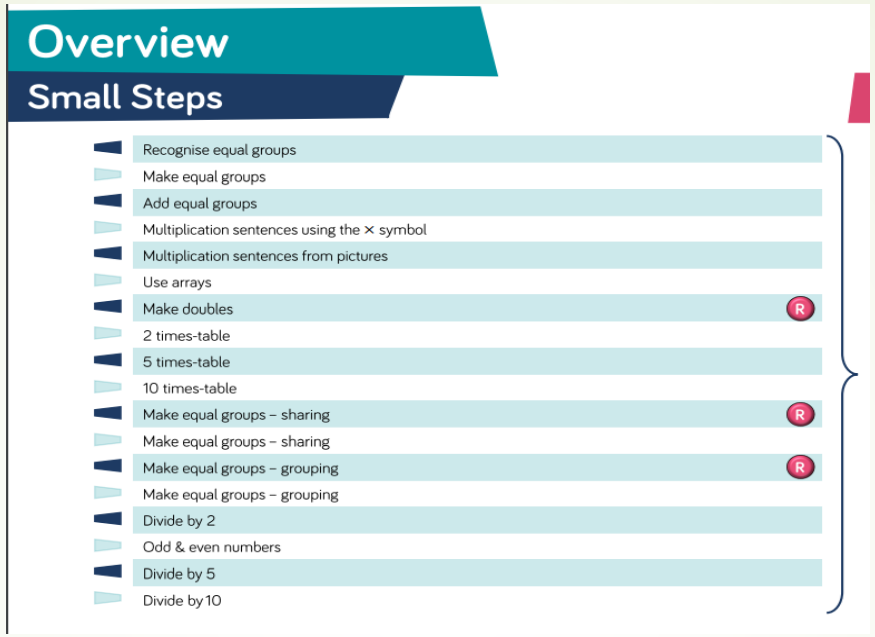
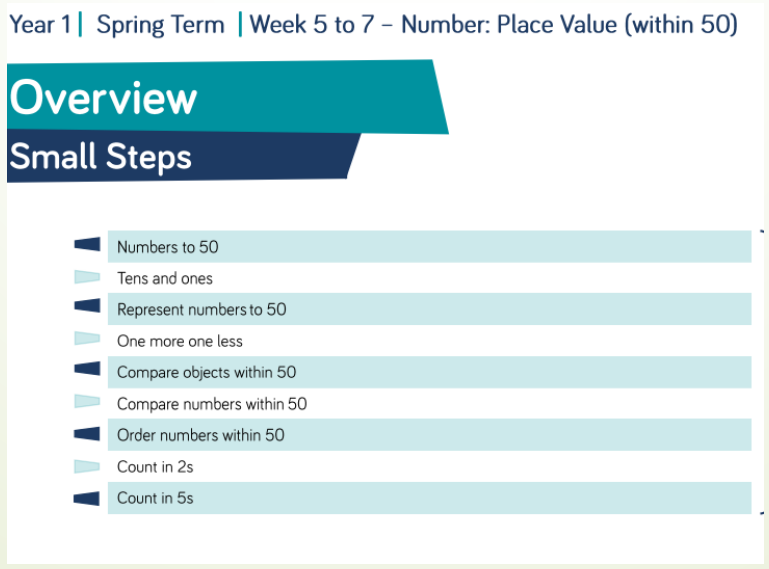


Overview

Small Steps

- Recognise equal groups
- Make equal groups
- Add equal groups
- Multiplication sentences using the × symbol
- Multiplication sentences from pictures
- Use arrays
- Make doubles (R)
- 2 times-table
- 5 times-table
- 10 times-table
- Make equal groups – sharing (R)
- Make equal groups – sharing
- Make equal groups – grouping (R)
- Make equal groups – grouping
- Divide by 2
- Odd & even numbers
- Divide by 5
- Divide by 10



Year 1 | Spring Term | Week 5 to 7 – Number: Place Value (within 50)

Overview

Small Steps

- Numbers to 50
- Tens and ones
- Represent numbers to 50
- One more one less
- Compare objects within 50
- Compare numbers within 50
- Order numbers within 50
- Count in 2s
- Count in 5s

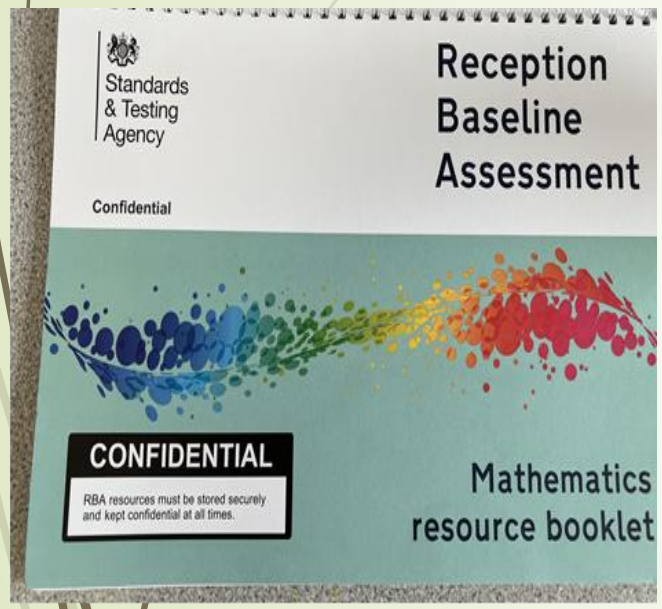
Long-term plans are constructed and built upon by each year group team.

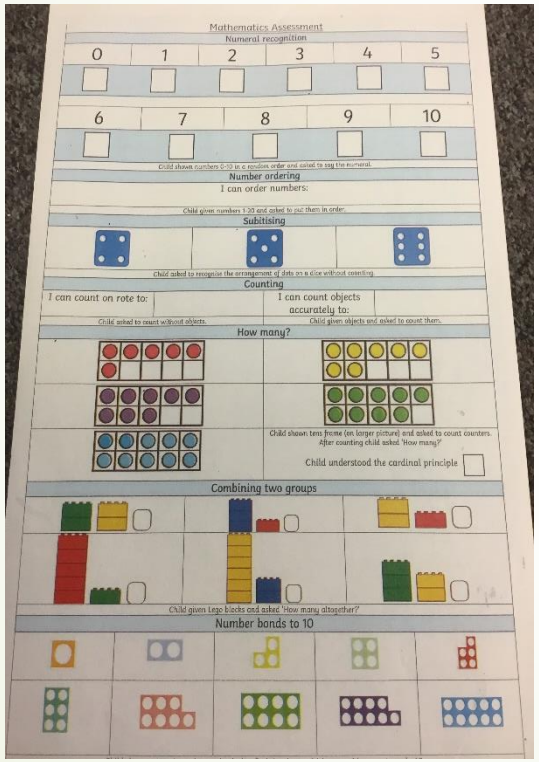
These include:

- key objectives taught from the National Curriculum
- White Rose Maths LTPs and MTPs used by all staff from EYFS – Yr 2
- NCETM Resources used throughout school.
- NCETM Mastering number used in Yr R – Yr 2

Measuring and Tracking Progress in the EYFS

Reception Baseline Assessment





All children upon entry to CCIS complete a Baseline Assessment. This data is stored by the government and used by R Teachers to assess prior knowledge before entry to school.

Children are then assessed throughout EYFS according to ELG and Development Matters documents to guide next steps of learning.

Tracking progress in Reception

Maths Assessment Class: R

	Autumn 1 Baseline	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics Covered	Verbally count to 10 Recognise the numerals to 10 Order the numerals to 10 Compare 2 groups, more/fewer I can subitse to 5 I can recognise and name 4D shapes	Subitising up to 4 Counting forwards and backwards 1-20 Counting to 5 Composition of numbers up to 5 2D shapes Days of the week Months of the year Seasons part-part whole Partners to 3, 4 and 5	Subitising further explore patterns within 5 and beyond Composition of 5/6 Begin to see that numbers within 10 can be composed of '5 and a bit' Missing/hidden parts of 5 Comparing sets Make unequal sets equal. Patterns that show a small group 1more Order numbers 0-20 linking cardinal and ordinal Verbal counting to 20 Develop counting skills	Explore Symmetrical patterns linking this with doubles Continue to consolidate their understanding of cardinality, working with larger numbers within 10 Become familiar with the counting pattern beyond 20 Explore composition of odd and even numbers (look at the 'shape' of these numbers Link even numbers with doubles Explore the composition of numbers within 10 Compare numbers reasoning.	Practise familiar subitising arrangements that expose 1more or doubles Use subitising skills to identify when patterns show same number but in a different arrangement Subitise structured and unstructured patterns Identify when it is appropriate to count and when to subitise up to 6 Verbal counting to 20 and beyond Starting at different numbers Develop confidence and accuracy in both verbal and object counting	Explore the composition of 10 Order sets of objects, linking this to their understanding of the ordinal number system Recognise coins and count using 1 pence's Learn how to use a rekenrek. Can recall number bonds to 5 (including subtraction)

Child's name	E or A	E= emerging	A= achieved			

Base Line : Autumn 1

Any weaknesses for the whole class are noted here and this is discussed at planning meetings and activities are included in the next half term.

Autumn 2

Any children not meeting is noted here and specific information is noted as to why they haven't met.

This is discussed in planning and activities and small 1:1 or groups are planned for in the next half-term .

This is completed each half term.

Children's termly data from Reception are also used and tracked on SIMs. This is used as the basis of discussion for Pupil Progress meetings to monitor and track a child's progress related to ARE.

Mastery Number Programme Introduced in 2021-22

Mastery Number Programme

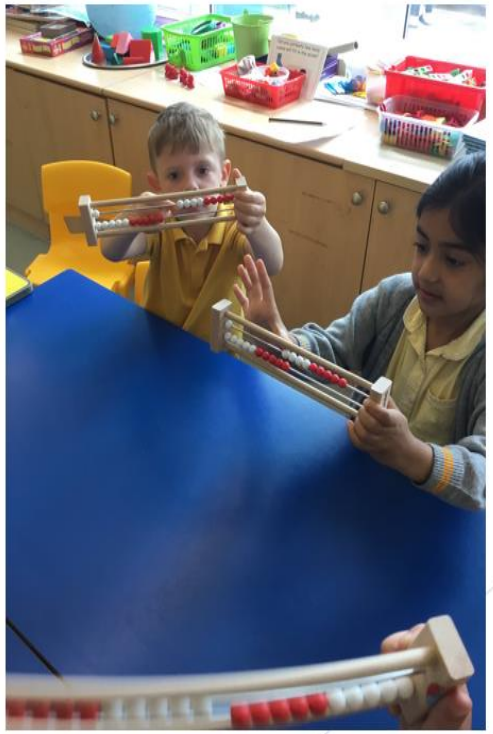
Overview of the programme

- It's for 4-7 year olds.
- Whole class teaching 4 days of the week.
- 10-15 minutes extra maths session. (number sense)
- The aim is to strengthen the understanding of number and fluency with number facts among children in the first 3 years of school.
- 1 lead teacher from reception , Year 1 and Year 2 receive training and resources equipping them to give their daily short 'number sense' session. The lead teachers support the other teachers in their year group.

- The materials include teachers notes, teacher slides and teacher resources.
- Central training - on line 3 sessions in the year .
- In the year programme the children use a range of materials and representations
- Lead teachers are encouraged to engage in an on line platform which is led by a maths specialist (will be a localised work group)
- The use of a rekenrek is one element of the Mastering Number Programme. It develops confidence and fluency.

A week of Mastery at Cheadle Catholic Infant School.

Reception : The introduction of the Rekenrek , learning to show amounts using 1 push. (Subitise to 5)



- Reception Automatically recall number bonds to 5.

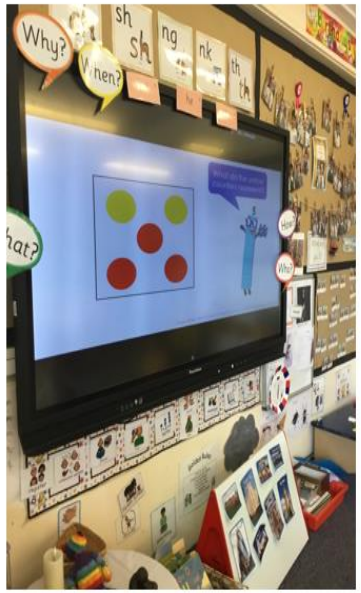
" I know that 2 and 3 makes 5.

If 3 frogs are on the log 2 are in the pond"

" 3 red to show the frogs on the log

and 2 yellow to show the frogs in the pond"

Stem sentence " 5 is made of 2 and 3."



Reception

Exploring 5 with the song/slides.
5 speckled frogs .

Year 1 Counters - making equal groups.

Pupil voice:
" Moving counters help me to solve problems"

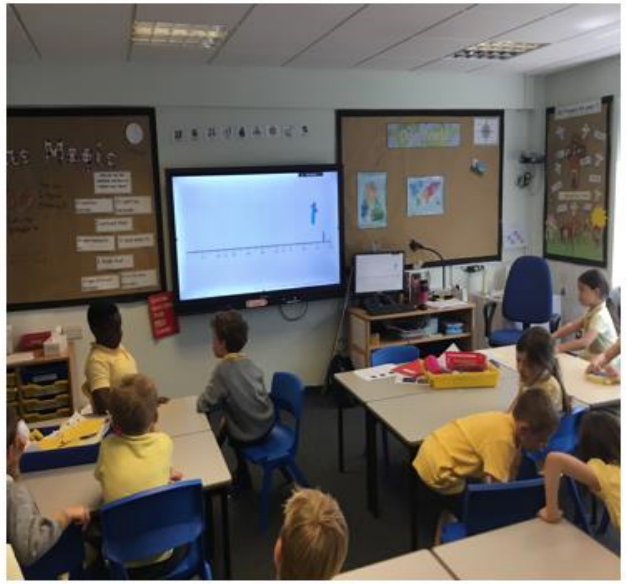
Pupil voice :
" Working with a talk partner means I have someone to help me"

" They help us count and show amounts."

" They help when I am counting in 2's"

" They are good to show odd and even"

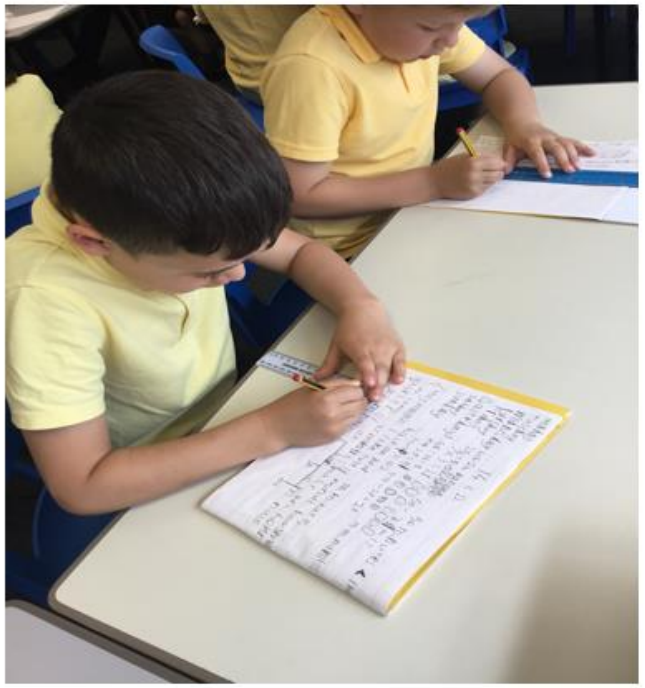
Year 2 Multiplies of 5 sit half way between multiples



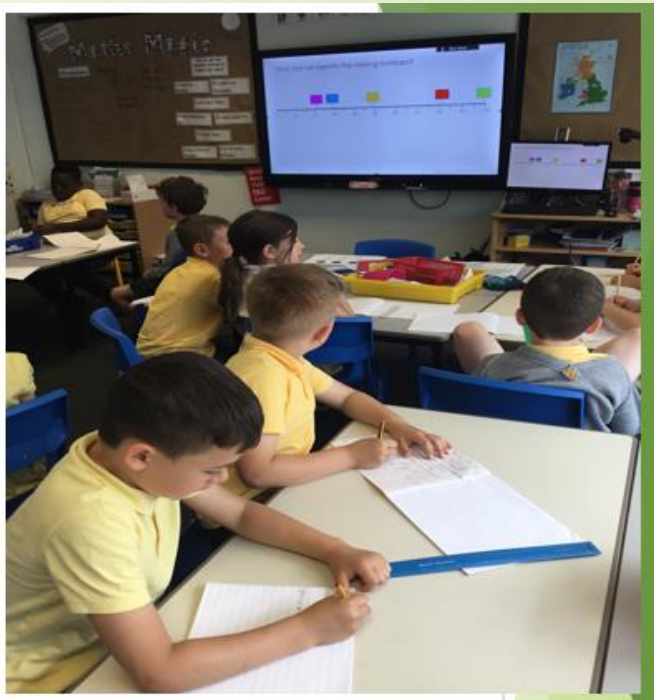
"I know that 20 comes before 25 because 20 is 5 less than 25. I counted in multiples of 5"

"45 is between 40 and 50"

" I know that 21 comes straight after 20 on the number line because 21 is 1 greater than 20"



Year 2
Multiplies of 5 sit half way between multiples



Impact on Cheadle Catholic infant school

Reception

- Repetition allows for a greater understanding and a strong number sense .
- They are fluent with their number facts. (stays in their memory)
- Excellent use of concrete to pictorial to abstract.
- We don't have different ability groups anymore.
- Subitizing to 5 is amazing. "see the amount don't count"
- The children keep up not catch up.
- Most of the new curriculum is covered in the Mastery programme.

Year 1 Teacher Voice

Mastery maths has opened up a whole new kinaesthetic approach to partitioning, doubles and place value .

The Rekenrek is another manipulative to support partitioning.

Subitizing - 1 amount 1 push

Repetition of stem sentences and has increased knowledge and fluency of number facts.

It has helped to close the gaps from reception, but not completely.

Year 1 Teacher Voice

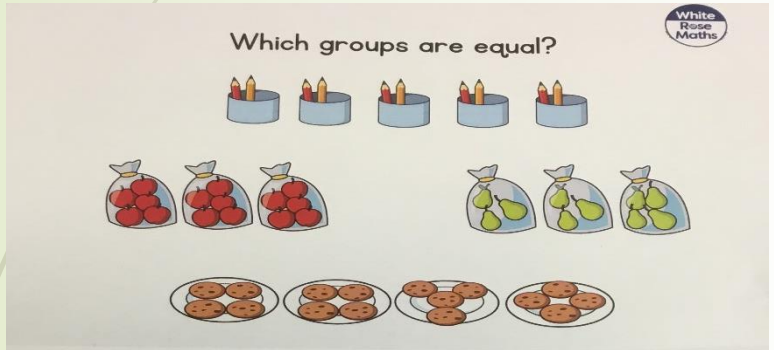
- Mastery maths has opened up a whole new kinaesthetic approach to partitioning, doubles and place value .
- The Rekenrek is another manipulative to support partitioning.
- Subitizing - 1 amount 1 push
- Repetition of stem sentences and has increased knowledge and fluency of number facts.
- It has helped to close the gaps from reception, but not completely.

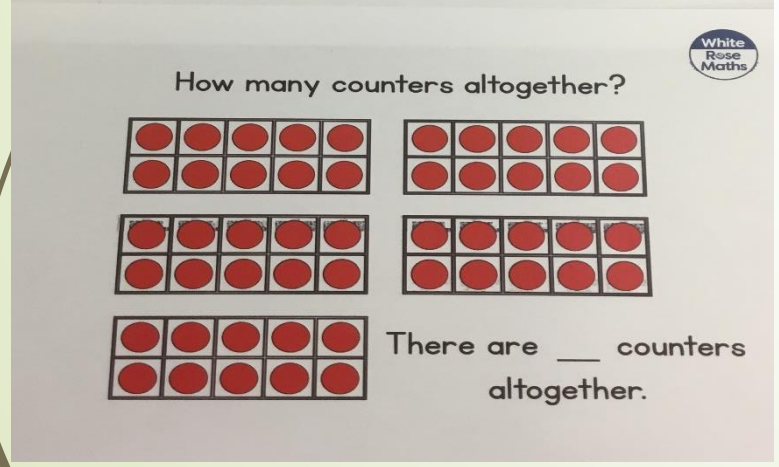
Year 2 Teacher Voice

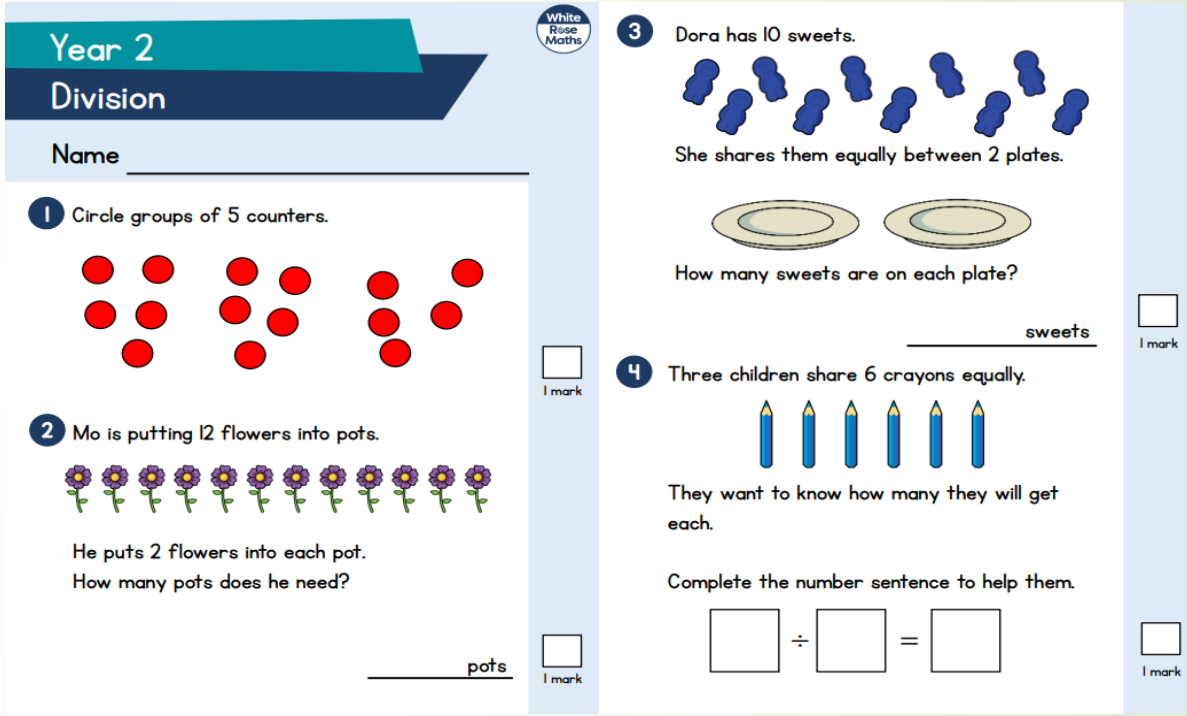
- An invaluable tool to assist with the start of the lesson. It is fully inclusive.
- Mastery maths has been an essential part of filling the gaps the children had after two years of disruption. It enabled children of all abilities to get back to basics and revisit the core building blocks needed to fully access the Year 2 curriculum. The mixture of repetition , visual cues and manipulatives seem to appeal to the whole class and help the learning 'stick' . Not only do they now recall key facts quickly and fluently but it has given the children the tools to describe and explain how they reach their answers which is such an important step in their learning.
- This year all children stay in whole maths lesson the whole time (no interventions groups)
- It has helped with the SAT's , the children are using their mental strategies and applying this to greater depth problems.
- After moderation we now know we have more children working at GD in maths.

Measuring and Tracking Progress

End of Unit WRM Tests used in KS1







Children's termly data from Year 1 and 2 are used and tracked on SIMs. This is used as the basis of discussion for Pupil Progress meetings to monitor and track a child's progress related to ARE.

SEND

A mastery approach to teaching Maths.

* Mastery maths uses a **CPA** approach.
  Concrete **P**ictorial **A**bstract

This approach uses concrete objects to build children's understanding, allowing them to see, feel and explore the numbers

- One step at a time.

One of the key aspects of mastery is small steps of progress. This targeted focus ensures a deep understanding and provides opportunities for success.

- Gradually reduced support.

Children are allowed to practise what they have learned in many different ways. This allows them to build confidence and procedural fluency.
(know the steps to work out a problem)

- Make it relevant

Setting the maths in a real-life context. This can help motivate and engage all children. We look for opportunities to draw out maths every day inside and outside the classroom. This not only practises what they have learned but also helps them see how it is relevant to them.

- Focus on mathematical language

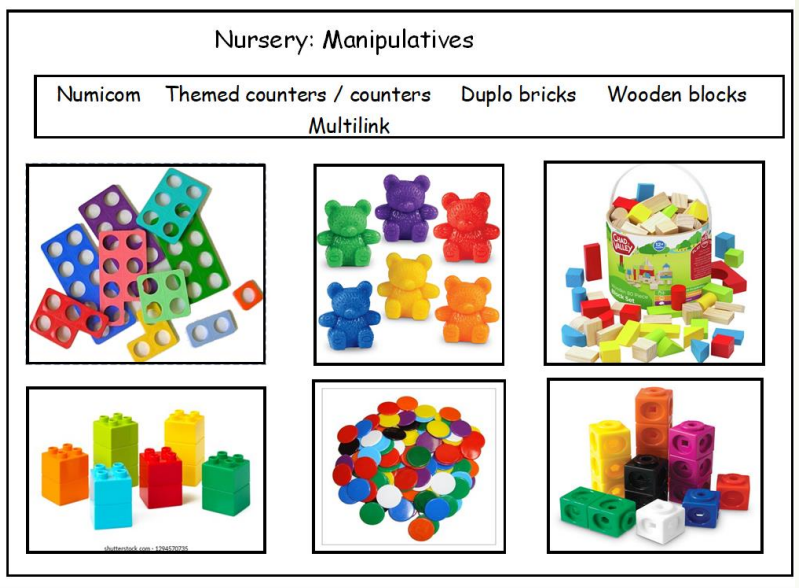
Using maths words frequently and consistently throughout the school helps embed the language and the concepts they represent.

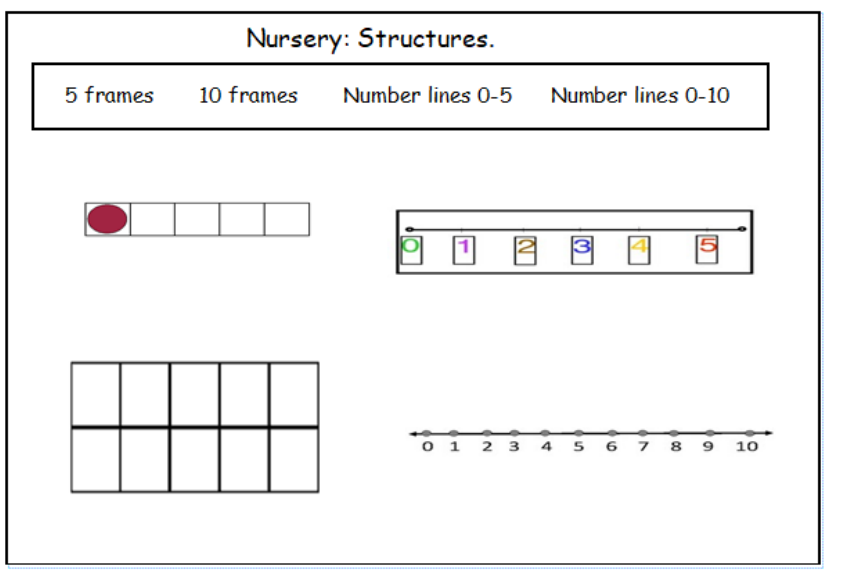
How can we make maths accessible to children with SEND at our school ?

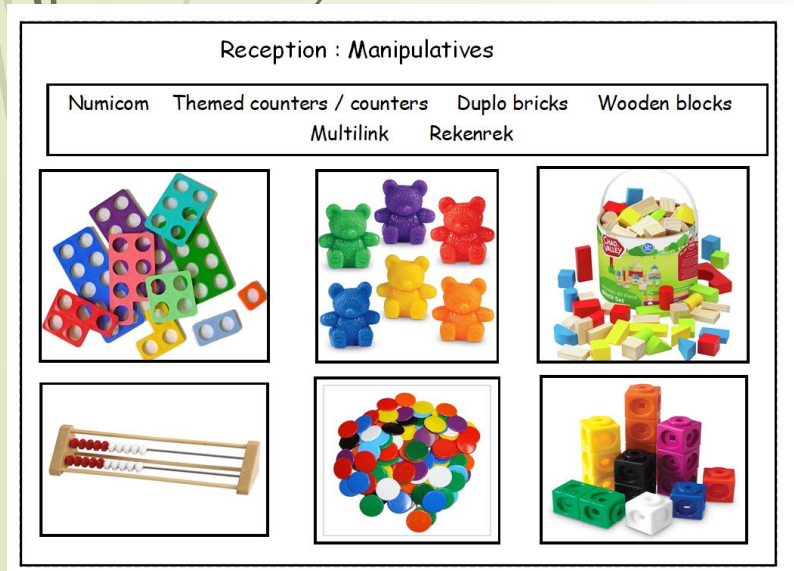
How can we make sure everyone reaches their full potential ?

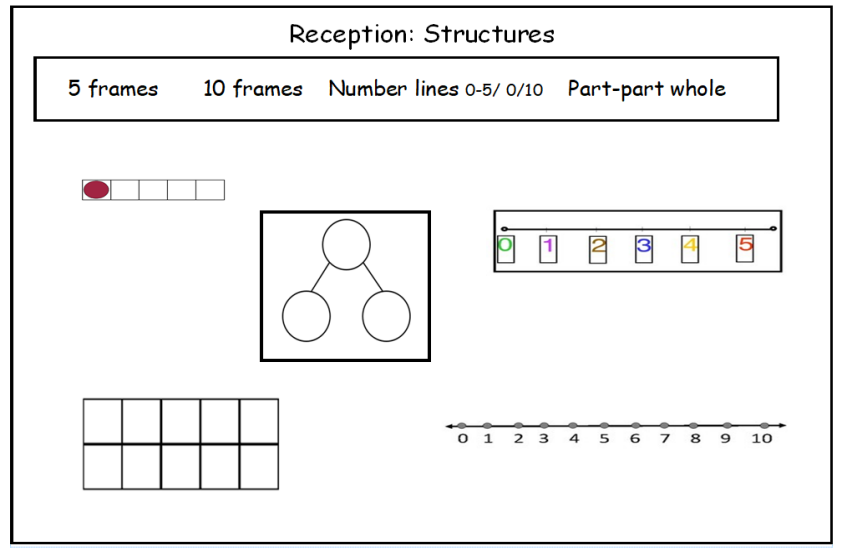
SEND

Manipulatives and Structures









Carefully matched manipulatives are used alongside each structure. All staff have a strong understanding of the progression of skills and use these to help develop a curriculum that matches the needs of each child in their class.

The children become very familiar with the concrete apparatus and structures which deepen their understanding of number sense. (mastery)

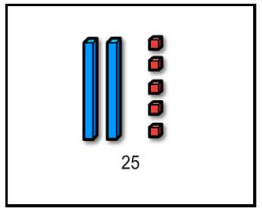
SEND

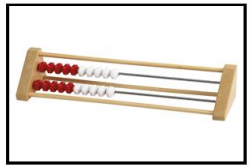
Manipulatives and structures Year 1 and 2

Year1 : Manipulatives

Numicom Themed counters / counters Base 10
Multilink Rekenrek Two coloured counters

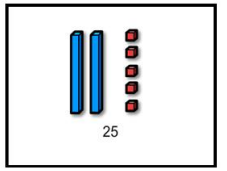


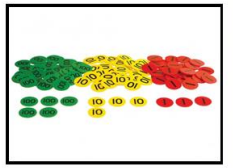
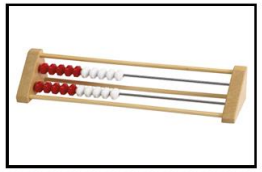




Year 2 : Manipulatives

Numicom Base 10 Place value counters rekenrek
coloured counters multilink

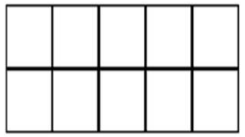
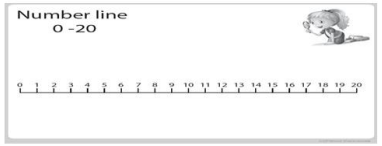



Year 1: Structures

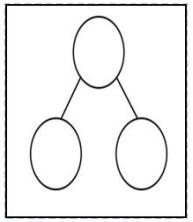
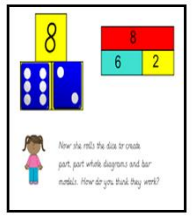
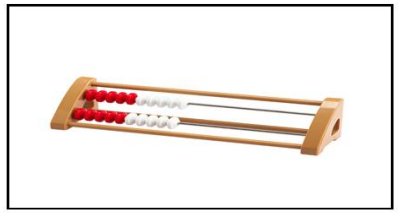
5 frames 10 frames Number lines 0 - 20 coloured counters
String beads (1- 100)
A variety of number lines 0-100/blank/2's/3's/5's and 10's



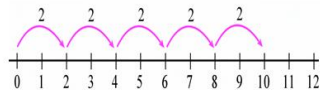
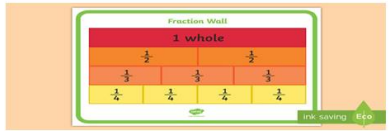
Year 1 : Structures

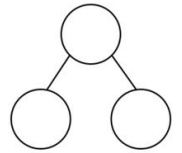
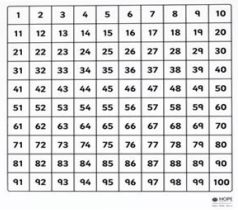
Part -part whole bar model rekenrek

Year 2 Structures.

10 frames Number lines (variety) 100 square Part -Part whole
Fraction Wall

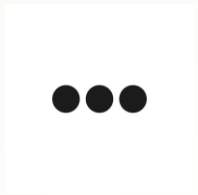




Pupil Voice: comments made in lesson observations January 2023

"I've got 3 , look 1,2,3" **N**

"I can make a triangle with my 3 sticks." **N**

" I can see 1 and 1 and 1" **N**



T: ***I think I've got fewer than Mia***. Isabella "No, you have more because you have 4 and Mia has 3. Look if I take 1 away from you it makes 3 so you must have more" **R**

Isabelle
" I know that 3 and 7 equals 10, so 13 add 7 must equal 20. **Year 2**

Stem Sentences in Year 1
"7 can be split into 5 and 2, 5 and 2 combined make 7.
" 7 can be spilt into 4 and 3, 4 and 3 combined make 7"

What does a maths lesson look like at our school ?

Reception

1. Mastery maths lesson (10-15 mins)
   Whole class

2. Main teaching lesson. Group work
   Maths of the Day outside maths teaching (active maths)
   Teacher led with 1 group linked to the mastery maths sometimes in a Prove it book.

I think 5 + 2 = 6 . Am I right ? Can you prove it ?

Two groups working independently individually or paired.

Year 1

1. Mastery maths lesson (10-15mins)
   Whole class

2. Main maths lesson White Rose Maths
   White board work with talk partner
   Whole class, group work, paired work collaboration. Recored in main maths books
   Practical and worksheet based. Prove it activity from Howard.

I think 10 - 2 =9 . Am I right ? Can you prove it ?

Year 2

1. Mastery maths lesson (10-15mins)
   Whole class

2. Main maths lesson (part 1)
   Can you still power point ? Recall from previous learning planned from assessments made.
   record in their maths jotters

3. Main maths lesson (part 2) White Rose Maths
   Whole class, group work, paired work collaboration
   Practical and worksheet based. Prove it activity from Howard. Record in maths jotters and main maths book.

Subject Evaluation

How do I find out what's going well and what needs to improve ?

- Subject leader days
- Regular book looks
- Learning walks
- Classroom observations
- Pupil voice
- Data monitored from Pupil Progress meetings each half term

Priority 1: Implement and Embed NCETM Mastering Number in EYFS & KS1 (2022).

Focus of the programme

Aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2.

The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number.

Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

Training delivered by the NCETM has been attended by all year group leads. Further termly training will be held to ensure the objectives are covered according to the guidance. SL has been in regular discussion with EYFS, Year 1 & 2 teachers to check progress and relevance of the programme and seen evidence of the children's learning.

Strengths

- **Mastery Approach to Teaching Maths :** Whole class teaching " keep up not catch up"
- **The second year of Mastering Number :** this has been taught much earlier this year in all year groups.
- **The new EYFS curriculum in 2021-2022 taught alongside mastery maths :** reception children were confident at subitising up to 5 and seeing numbers within numbers. They had a strong sense of the numbers up to 10.
- **Year 1 :**The use of stem sentences. Strong connections between concepts. Use of manipulatives and structures is very good. Reasoning verbally. The children can choose their own strategies when solving a problem.
- **Year 2 :** Making links to higher numbers and problem solving. Place value. Can you still ? repeated learning every day.

Areas of Development

- **Reception** : Recall of number bonds to 10. (2022)
- **Action :** mastery maths started earlier, so more time to teach number bonds to 10 (2023)
- **Year 1 :** greater than and less than symbols. It is introduced very early in the scheme and can cause confusion. (2022)
- **Action** : provide opportunities to teach greater than and less than in a more visual/ concrete way. Take time to revisit. (2023)
- **Year 2 :** Greater depth evidence, problem solving and reasoning. Scales – evidence. Time- at greater depth (5 minute intervals) (2022)
- **Action :** Plan for opportunities to develop and show greater depth knowledge. (NCETM) Jotter books being used this year instead of whiteboards (2023)
- Focus for the year with the Maths Hub (sustaining phase) "depth through questioning "

Next steps:

- **Continue 2023 Monitoring:** Pupil voice and lesson observations, data analysis
- **Invite the parents in for a Mastering Number at Home workshop :** Reception in February, Year 1 and Year 2 in March. Involve as many parents as possible to share mastery math teaching.