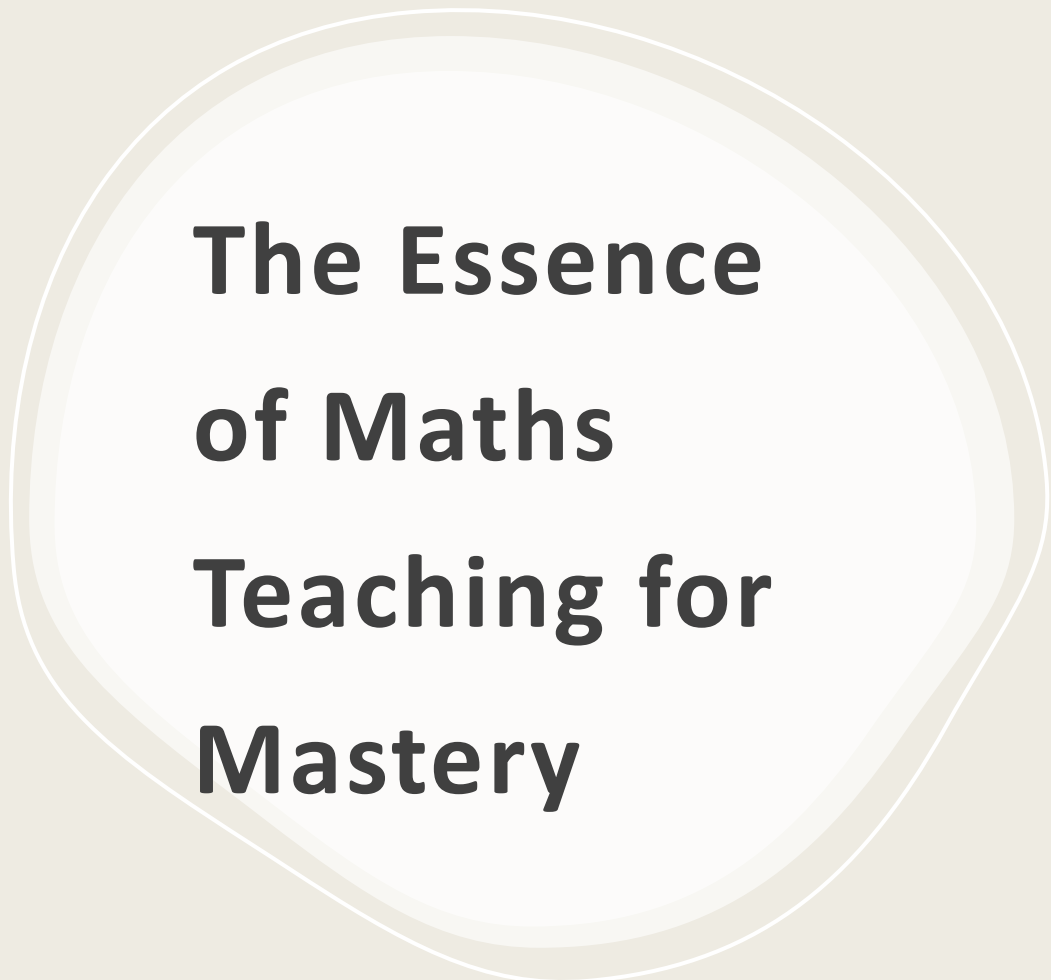




Maths Mastery
Parent Maths Information Evening

7.10.26

Sulhamstead & Ufton Nervet CE Primary School



The Essence of Maths Teaching for Mastery

- Maths teaching for mastery rejects the idea that a large proportion of people just 'can't do maths'
- All pupils are encouraged by the belief that by working hard at maths they can succeed.
- Pupils are taught through whole class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind.
- Mathematics teaching for mastery assumes everyone can learn and enjoy mathematics. Mathematical learning behaviours are developed such that pupils focus and engage fully as learners who reason and seek to make connections.

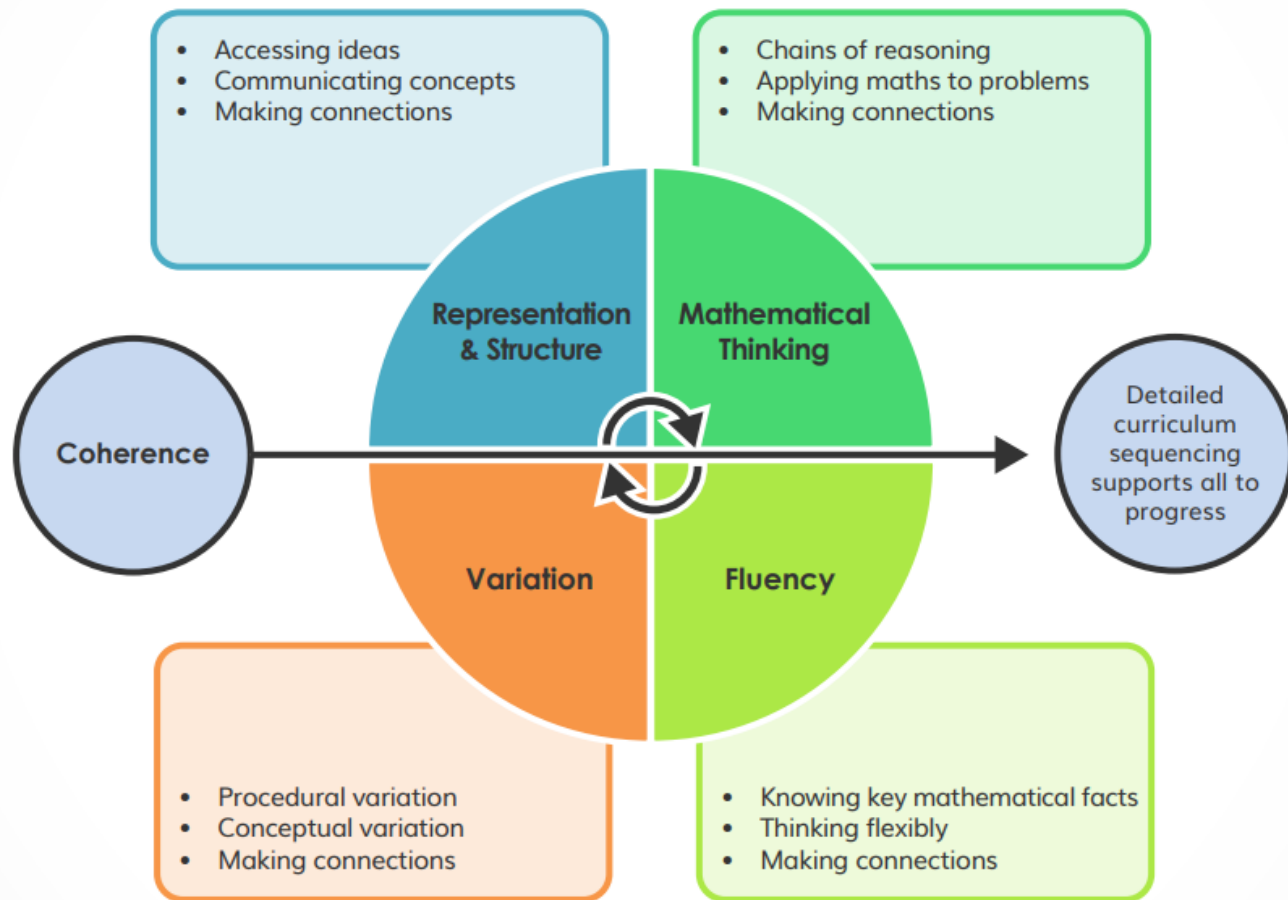


In the classroom

- Pupils are taught through whole-class interactive teaching, enabling all to master the concepts necessary for the next part of the curriculum sequence.
- In a typical lesson, the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion, enabling pupils to think, reason and apply their knowledge to solve problems.
- Use of precise mathematical language enables all pupils to communicate their reasoning and thinking effectively.
- If a pupil fails to grasp a concept or procedure, this is identified quickly, and gaps in understanding are addressed systematically to prevent them falling behind.
- Significant time is spent developing deep understanding of the key ideas that are needed to underpin future learning.
- Key number facts are learnt to automaticity, and other key mathematical facts are learned deeply and practised regularly, to avoid cognitive overload in working memory and enable pupils to focus on new learning.

Teaching for Mastery

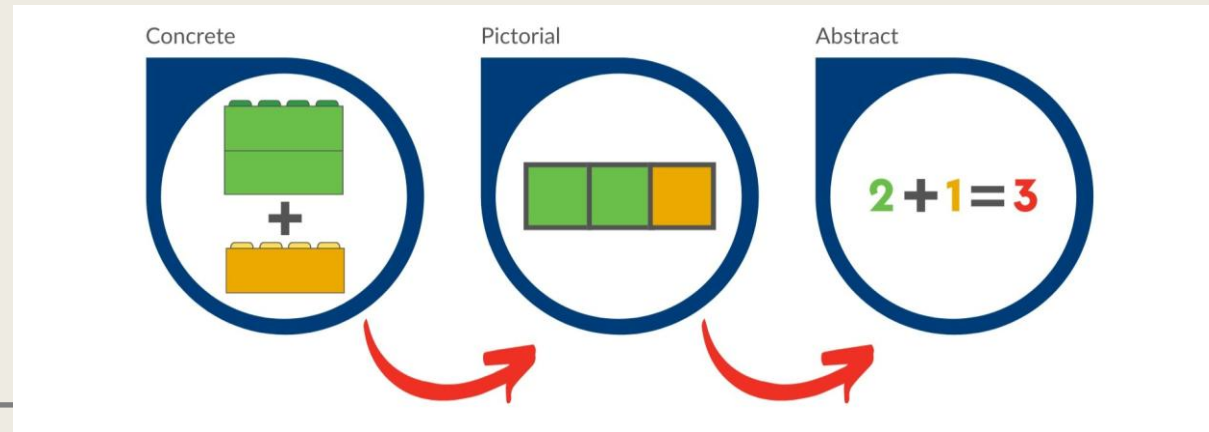
Five Big Ideas



**5 Big Ideas
for Mastery**



Concrete Pictorial Abstract



- Concrete, Pictorial, Abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths in pupils

- This approach is used from Reception through to Year 6

- Children in Year 6 are still encouraged to use concrete objects in lessons

CONCRETE



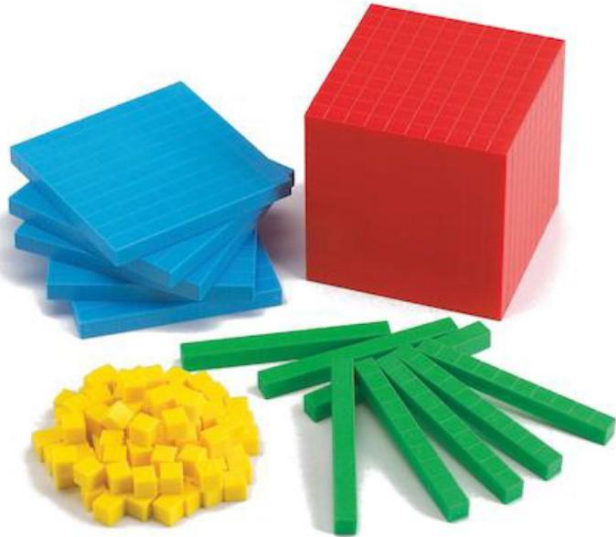
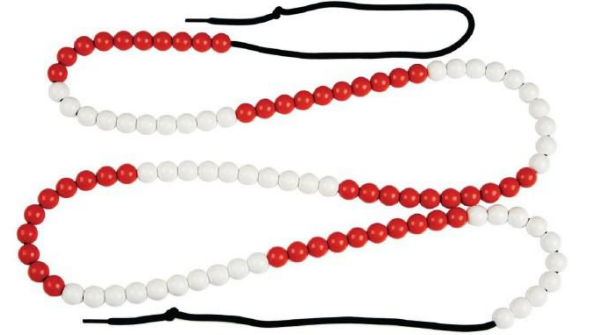
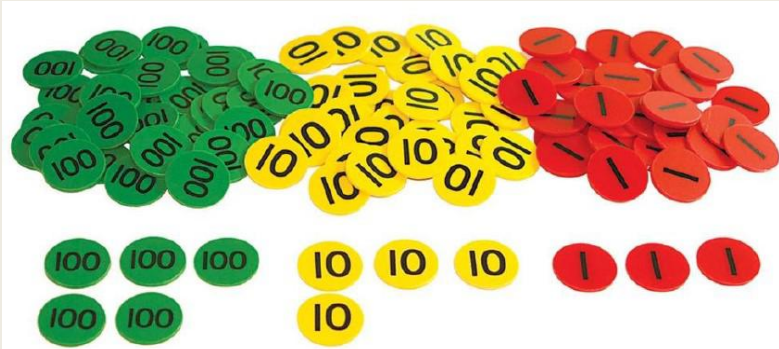
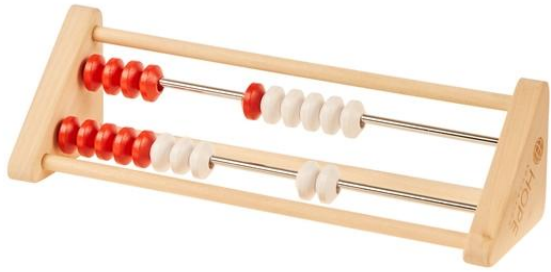
Children might begin by handling real objects...



...then using physical representations of them.

- As part of the CPA approach, new concepts are introduced through the use of physical objects or practical equipment.
- These can be physically handled, enabling children to explore different mathematical concepts. These are sometimes referred to as maths manipulatives and can include ordinary household items such as straws, pasta shapes or dice, or specific mathematical resources such as dienes or Numicon.
- The abstract nature of maths can be confusing for children, but through the use of concrete materials they are able to 'see' and make sense of what is actually happening.
- Previously, there has been the misconception that concrete resources are only for learners who find maths difficult. In fact, concrete resources can be used in a great variety of ways at every level. **All children, regardless of ability, benefit from the use of practical resources** in ensuring understanding goes beyond the learning of a procedure.
- Practical resources promote reasoning and discussion, enabling children to articulate and explain a concept. Teachers are also able to observe the children to gain a greater understanding of where misconceptions lie and to establish the depth of their understanding.

Some of the concrete resources we use in school





**However, there really
is no end of what you
can use...**



gettyimages
Credit: Dushin and Starr

Activity 1: Build the Number with Base 10 (Addition & Exchange)

Objective

Demonstrate how children develop understanding of place value and column addition before moving to formal written methods.

Resources

- Base 10 equipment/Dienes (ones, tens, hundreds)
- Whiteboards and pens
- Place value mats

Parent Task

Solve:

$$\mathbf{247 + 186}$$

- Build both numbers using Base 10 apparatus.
- Combine the blocks.
- Exchange 10 ones for 1 ten.
- Exchange 10 tens for 1 hundred if needed.
- Record the calculation using the column method.

Discussion Points

- Why do we exchange?
- What does the "carried" digit actually represent?
- How does the equipment help children understand the written method?

Key Message

Children are not just memorising a procedure; they are understanding the value of the digits.



- Once children are confident with a concept using concrete resources, they progress to drawing pictorial representations or quick sketches of the objects. By doing this, they are no longer manipulating the physical resources, but still benefit from the visual support the resources provide.
- Pictorial recording is key to ensuring that children can make the link between a concrete resource and abstract notation. Without it, children can find actually visualising a problem difficult.
- One of the most common methods of representing the pictorial stage is through the bar model which is often used in more complex multi-step problem solving.

Teaching the Four Operations with Bar Models

ADDITION

$$3 + 4 = ?$$



$$3 + 4 = 7$$

SUBTRACTION

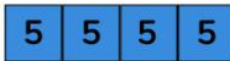
$$18 - 3 = ?$$



$$18 - 3 = 15$$

MULTIPLICATION

$$4 \times 5 = ?$$



{ ? }

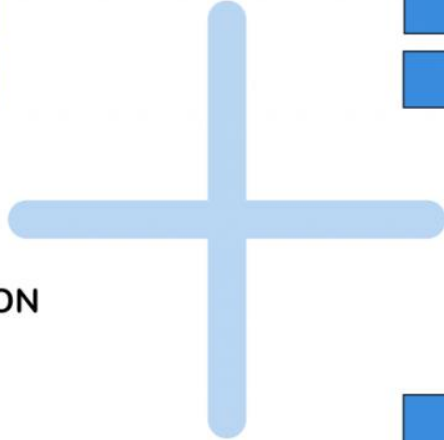
$$4 \times 5 = 20$$

DIVISION

$$27 \div 9 = ?$$

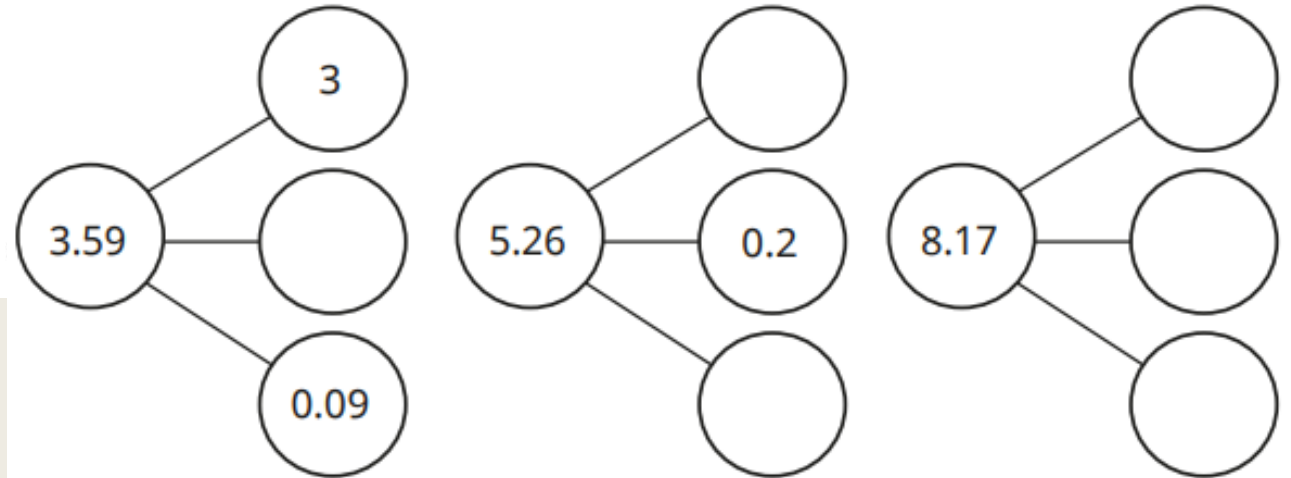


$$27 \div 9 = 3$$



Bar & Part-Whole Models

Complete the part-whole models.



Activity 2: Bar Models for Subtraction

Objective

Show how the bar model helps children visualise relationships between numbers and supports reasoning.

Resources

- Printed bar model templates
 - Counters
 - Pens
-

Parent Task

Present the problem:

There are 356 children in school.
128 are in KS1.
How many are in KS2?

Parents:

- Draw and label a bar model.
- Represent the whole and one part.
- Calculate the missing part.
- Solve using counters if needed.

Extension Question

There are 356 children altogether.
KS2 has 228 children. How many are in KS1?

Discussion Points

- How does the model show the relationship between numbers?
- Why might this be easier than immediately choosing an operation?

Key Message

Children learn to understand the structure of a problem before calculating.

Finally, children learn to use abstract symbols to solve problems.

$$10 + 7 = 17$$

Once children have a secure understanding of the concept through the use of concrete resources and visual images, they are then able to move on to the abstract stage.

Abstract is the 'symbolic' stage, where children use abstract symbols to model problems.

To be able to access this stage effectively, children need access to the previous two stages alongside it. They will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem.

For the most effective learning to take place, children need to constantly go back and forth between each of the stages. This ensures concepts are reinforced and understood.

Scheme of Work

- White Rose is a scheme of work (SOW) which we use for teaching maths.
- We use this alongside other resources to ensure our children get the most engaging and thorough resources possible.
- There are other SOWs currently available to schools, however, we decided that White Rose was the best fit for our children.
- At SUN, we have developed working links with the Maths Hub, based at The Willink and have implemented the Mastering Number programme in Reception, KS1 and lower KS2.
- In KS2, we have introduced Power Maths Text Books – which compliment the White Rose learning



EYFS/Year 1 – Number Sense

Subitising

Developing a deep understanding of pattern in number

Knowing how numbers relate to each other

Knowing how numbers can be composed of other numbers
and manipulated

Applying this knowledge to real life situations

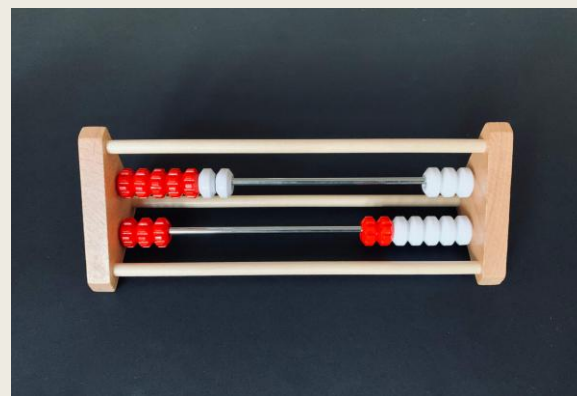
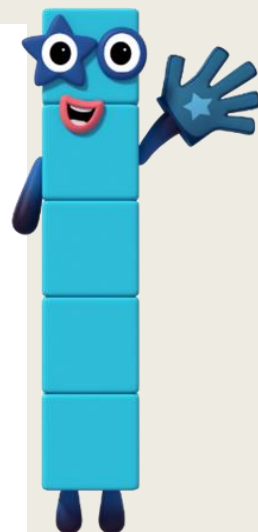
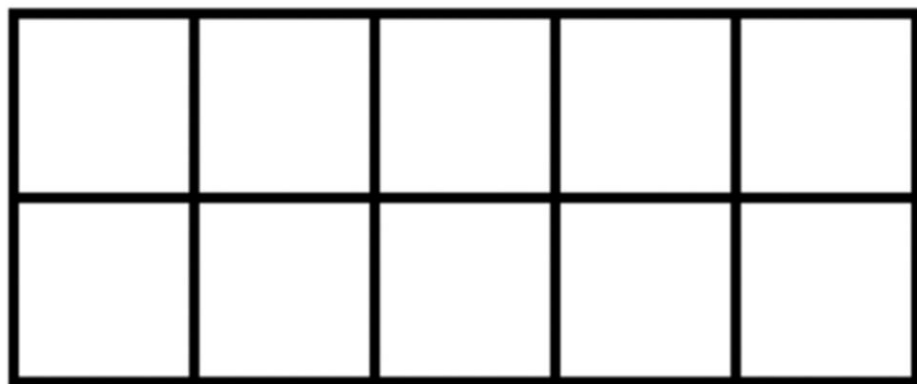
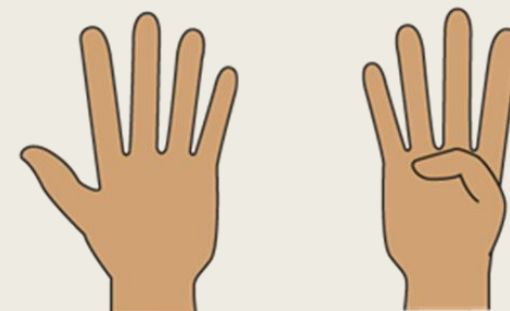
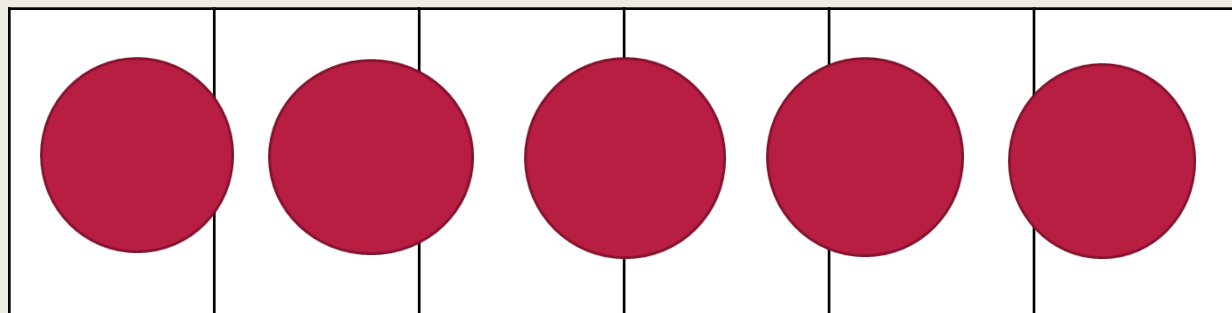
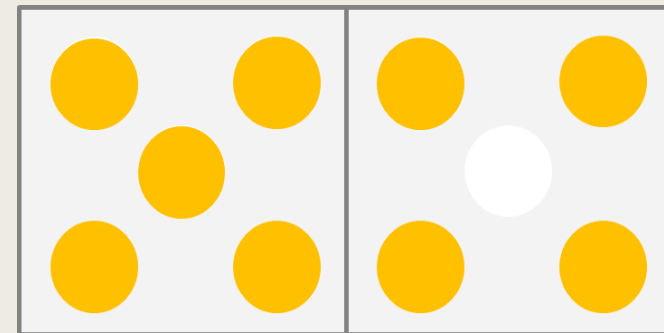
EYFS/Year 1 - Perceptual Subitising

What do you see and how do you see it?

What do you notice?



EYFS Year 1 – Conceptual Subitising





EYFS/Year 1



EYFS/Year 1/Year 2/Year 3/Year 4

Mastering Number – Number time!

Scheme we are following for the number part of Reception Maths.

Shape and measure is taught separately.

For Year 1 and 2 forms the beginning of their Maths lesson for 10-15 mins.

Using a rekenrek - • <https://www.youtube.com/watch?v=gtb7X2UJNWw>

Want to know more?

<https://www.ncetm.org.uk/maths-hubs-projects/mastering-number-at-reception-and-ks1>

<https://youtu.be/4KtifCNIYy4>

Go out Noticing: Family walks, at the supermarket, in the car.
Instead of "How many?" ask "What do you notice?"

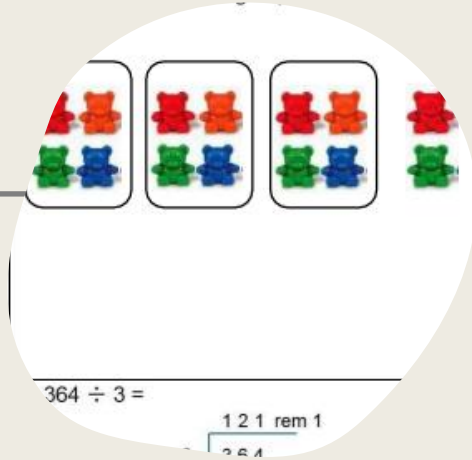
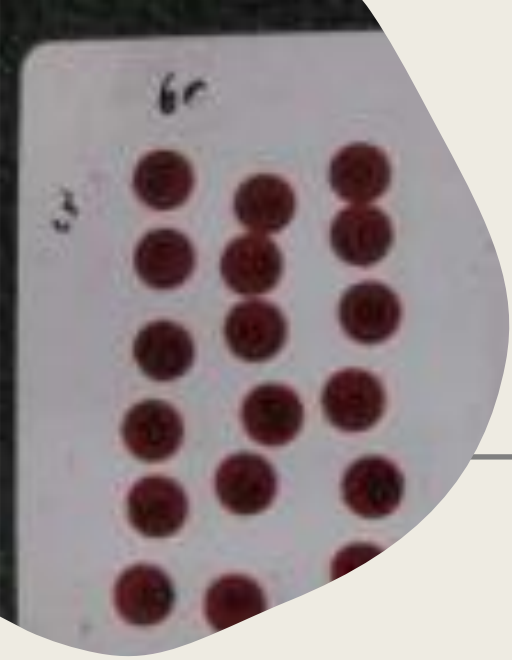
Each Maths lesson at S.U.N consists of...

- ☐ Retrieval practice & fluency at the start of every lesson
- ☐ Self-assessment using RAG rating at start of lesson related to L.I.
- ☐ Input, reference to prior/new learning/vocabulary
- ☐ Equipment is available to be used at all times
- ☐ Independent or paired/group work – problem solving / reasoning
- ☐ Plenary
- ☐ Feedback/ RAG rating at end of the lesson

Multiplication & Division

Multiplication and division						
Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
double	multiplication	multiplication tables	exchange	factor pairs	multiples	multi-digit numbers
half	division	commutative	mathematical statements	formal written layout	factors	long division
twice as many	arrays	repeated addition	missing number problems	distributive law	prime numbers	
equal			integer scaling problems	remainders	square numbers	
unequal			correspondence problems		cube numbers	
share			derived facts		short division	
group					product	
odd					dividend	
even					divisor	
					quotient	
					operations	

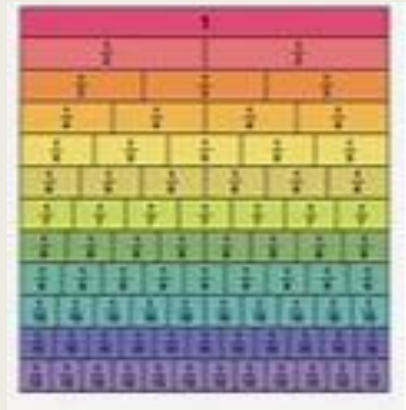
Year 5 and 6- Concrete



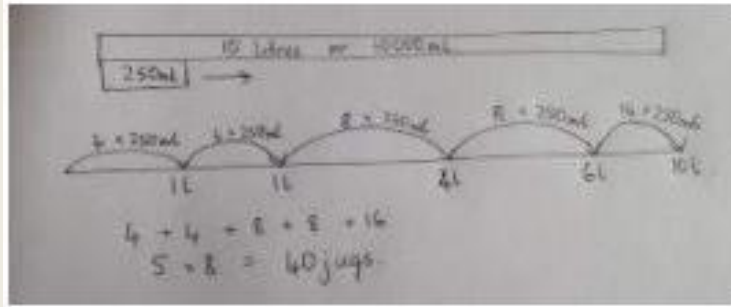
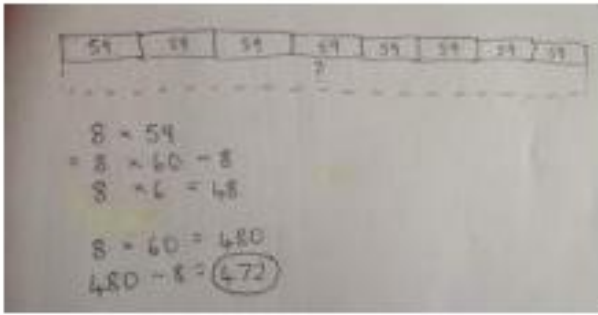
Place value counters are used to represent larger numbers into the millions and to support multiplication.

It is important at this stage that they always multiply the ones first, followed by the tens.

Divide objects/ place value counters between groups and see how much is left over.



Year 6- pictorial

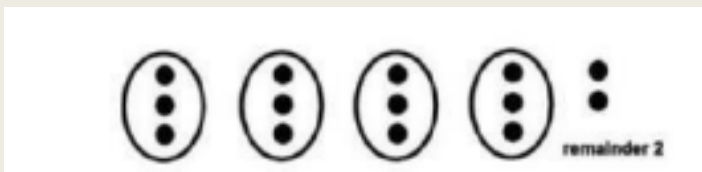
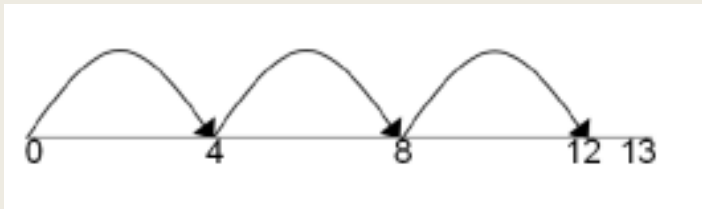


Drawing place value grids also helps children to visualise the direction the digits move when multiplying/dividing by 10/100/1000 etc.

Bar models and number lines are used when dividing and multiplying. They can support learners when solving problems with multiplication alongside the formal written methods.

When completing division, jumping along a number line can help children to see how many more you need to jump to find a remainder.

Drawing dots and grouping them together to divide an amount, clearly shows the remainder.



Year 5 & 6- multiplication

Eventually, children move onto the abstract when solving multiplication. They need to have a secure understanding of the process when using manipulatives and pictures, to gain a firm grasp of the abstract methods.

$$\begin{array}{r} 74 \\ \times 63 \\ \hline 12 \\ 210 \\ 240 \\ + 4200 \\ \hline 4662 \end{array}$$

This moves to the more compact method.

$$\begin{array}{r} 1342 \\ \times 18 \\ \hline 13420 \\ 10736 \\ \hline 24156 \end{array}$$

Year 5 & 6- division

Children move onto the abstract and learn the formal bus stop method. They learn the accompanying vocabulary to go with each part of the calculation.

Once they understand remainders, they begin to express them as fractions or decimals according to the context.

The final formal written method is learning how to complete long division.

$$\begin{array}{ccccccc} 29 \div 8 = 3 \text{ REMAINDER } 5 \\ \uparrow \quad \uparrow \quad \uparrow \quad \quad \uparrow \\ \text{dividend} \quad \text{divisor} \quad \text{quotient} \quad \quad \text{remainder} \end{array}$$

$$\begin{array}{r} 8 \ 6 \ r \ 2 \\ 3 \overline{) 4 \ 3 \ 2} \\ 5 \end{array}$$

begin to express as a fraction or decimal according to the context.

$$\begin{array}{r} 1 \ 8 \ 6 \ 1/5 \\ 5 \overline{) 9 \ 4 \ 3 \ 1} \\ 3 \ 5 \overline{) 5 \ 1 \ 1 \ . \ 0} \end{array}$$

Activity 3: Multiplication with Arrays and Counters

Objective

Demonstrate how multiplication is built from equal groups and arrays before formal multiplication methods.

Resources

- Counters
 - Array mats or squared paper
 - Multiplication grids
-

Parent Task

Create an array for:

$$6 \times 4$$

Then:

$$14 \times 6$$

- Build the array with counters.
- Describe what you notice.
- Partition 14 into 10 and 4.
- Calculate:
 - $10 \times 6 = 60$
 - $4 \times 6 = 24$
 - Total = 84

Distributive Law

The Distributive Law states that multiplying a number by a group of numbers added together gives the same result as doing each multiplication separately

Discussion Points

- How does the array prove the answer?
- How does this link to the distributive law?
- How does this support later long multiplication?

Key Message

Manipulatives help children see *why* multiplication works, not just recall facts.

Maths Vocabulary

Language is essential to the development of numeracy and mathematical skills throughout Reception, KS1 and KS2. Without a firm grasp on the vocabulary surrounding the subject of mathematics, things can quickly become disjointed and confusing to young minds. We can expect pupil's use of language to vary in its consistency, but it is worth paying attention to whether they are forming, using and applying the key features of language development as part of their maths activities.

How to help at home

- Complete maths homework showing workings & pictorial representations, TTRS
- Practice times tables, number bonds & facts – little and often
- Play games
- Sing songs in the car on the way home/around the supermarket/walking home
- Use the correct vocabulary when talking mathematically
- Praise effort – we learn from mistakes

There are 10 fun ways to develop KS1 & KS2 maths vocabulary.

Call My Bluff: This game gives the pupils mathematical vocabulary words and definitions. They then decide which choice is correct and use dictionaries to confirm the correct definition.

Ready, Steady, Look: Pupils race to find specific words in their dictionaries, which develops skills in the use of dictionaries at the same time as developing the awareness of mathematical vocabulary.

Give us a Clue: Guess the word from its definition then confirm whether you're right by checking in the dictionary.

Speechless: Using pencil and paper, but without speaking or writing any word, define a word by drawing examples.

Crosswords: Design and make crosswords using mathematical vocabulary.

Countdown: Give anagrams of a word, with its definition, and let the pupils race against the clock to solve the anagram.

Maths Attack: Develop understanding of particular concepts and specialist vocabulary by asking pupils to develop the definitions and examples given in the dictionary. Produce a fact sheet or poster with as many examples as possible to define the word.

Maths Hangman: Play the age-old game using only maths vocabulary words.

Maths Mastermind: Challenge pupils to read maths dictionaries to find words others might not know. Play a Mastermind-type game where one player turns in the hot seat.

The Yes/No game: A pupils, or team of pupils, ask questions in an attempt to define a word.



Sulhamstead & Ufton Nervet CE Primary School
Mathematics Vocabulary Progression document (YR-Y6)

This document is designed to assist with the teaching of vocabulary across EYF5, White Rose schemes of learning, long-term overviews and knowledge in which year group vocabulary should be explicitly taught. It should be revisited in subsequent year groups to ensure progression. This document is fully editable so language can be modified to suit your school.

The document has been introduced earlier (shapes for instance) so that the coverage is progressive.

Maths Activities For Children

Real Life Learning

Probably never stopped to think about it, but maths helps us with so many everyday things. From making lunch to understanding bus timetables – there are hundreds of everyday things that involve maths.

Make the most of this learning opportunity by making maths practice part of your everyday family routine. Here are some simple ideas on how to incorporate more maths into your daily routine with your children.

What do we mean by everyday maths?

Everyday maths is the maths that is required to live our daily lives. This includes simple mathematical concepts such as adding, subtracting and multiplying or telling the time. It's the maths we use every day, usually without even noticing.

How is maths used in everyday life?

Maths forms an important part of everyday life.

There are so many ways we use lots of areas of maths in daily life and you might not realise you're using it.

Here are some simple, everyday examples where we use our mathematical skills:

Useful Resources

- Maths vocabulary progression document
- Maths Vocabulary games
- Maths activities for Real Life Learning

Everyone can!

We believe that all children are capable of understanding maths and are neither 'born with the maths gene' or are 'just not good at maths .' They all have the potential to 'go deeper' and broaden their understanding of mathematical Concepts.

www.youtube.com/watch?v=ZonomJumRoM

Useful Maths Learning Resources

- White Rose Education: <https://whiteroseeducation.com/parent-pupil-resources/maths/free-downloads>
- Third Space Learning: Maths Learning Resources <https://thirdspacelearning.com/maths-resources/>
- Times Tables practice grids: <https://www.mental-arithmetic.co.uk/multiplication-grids-pdf-generator.htm>
- <https://mathsbot.com/printables/timesTables>
- NRICH - curriculum linked resources: <https://nrich.maths.org/>
- youcubed: <https://www.youcubed.org/resource/parent-resources/>
- NCETM - Mastery, problem solving & reasoning resources: <https://www.ncetm.org.uk/>
- Maths Frame- Online maths games <https://mathsframe.co.uk/en/resources/category/22/most-popular>
- BBC - Online Maths games: <https://www.bbc.co.uk/bitesize/articles/zdjkjfr#z9cdh4j>
- BBC – Times tables songs: [Times tables games and songs 1-12 - BBC Bitesize](#)
- Top Marks - Online maths games: <https://www.topmarks.co.uk/>