Focus on Mathematics

Intent: Enjoy – Enquire – Excel

We aim to:

- Develop a love and enjoyment of Mathematics
- Build knowledge through a broad, vocabulary-rich curriculum, with a skills-based focus that values practical opportunities and encourages the children to enquire
- Offer high quality teaching with high expectations for all
- Relate Mathematics to everyday life and maximise opportunities for it in our environment
- We give children a firm foundation on which they can build at secondary school

Intent: Enjoy – Enquire – Excel

- We aim to teach for **deep and secure understanding for all pupils** in our school, through a range of tasks which develop children's skills in line with the aims of the National Curriculum; fluency, reasoning and solving problems. The work is delivered through **whole class lessons** which are carefully planned to help develop children's mathematical understanding. Key concepts of number and place value, calculating, fractions, geometry, statistics and space are broken into small steps to ensure all children are able to access the learning. Children are **challenged appropriately through rich, deep tasks** which encourage them to **think deeply, reason mathematically and apply their understanding in a range of contexts.**

- **We believe that all children can achieve in Mathematics** and encourage all of our pupils to approach their learning in this subject with a positive mindset. Our positive mindset mascot, the 'YouCan Toucan' helps the children to think about and remember our messages of #YesUCan.

Intent: Enjoy – Enquire – Excel

Teachers use a **range of resources** when teaching and try where possible, to introduce new topics with **appropriate concrete and visual resources**. These enable children to gain a deep understanding of the mathematical concept so that the **learning is sustainable over time**. This allows children to **build new learning upon prior knowledge** whilst always striving to **consolidate those key skills** they have already learned.

In addition to daily Mathematics lessons, the children also receive **daily 'number fluency' sessions**. These sessions provide an opportunity for **practicing key number and arithmetic skills**. The sessions are taught and focused, encouraging children to make connections, see patterns, build their arithmetical fluency and work together to explore mathematical ideas and conjectures.

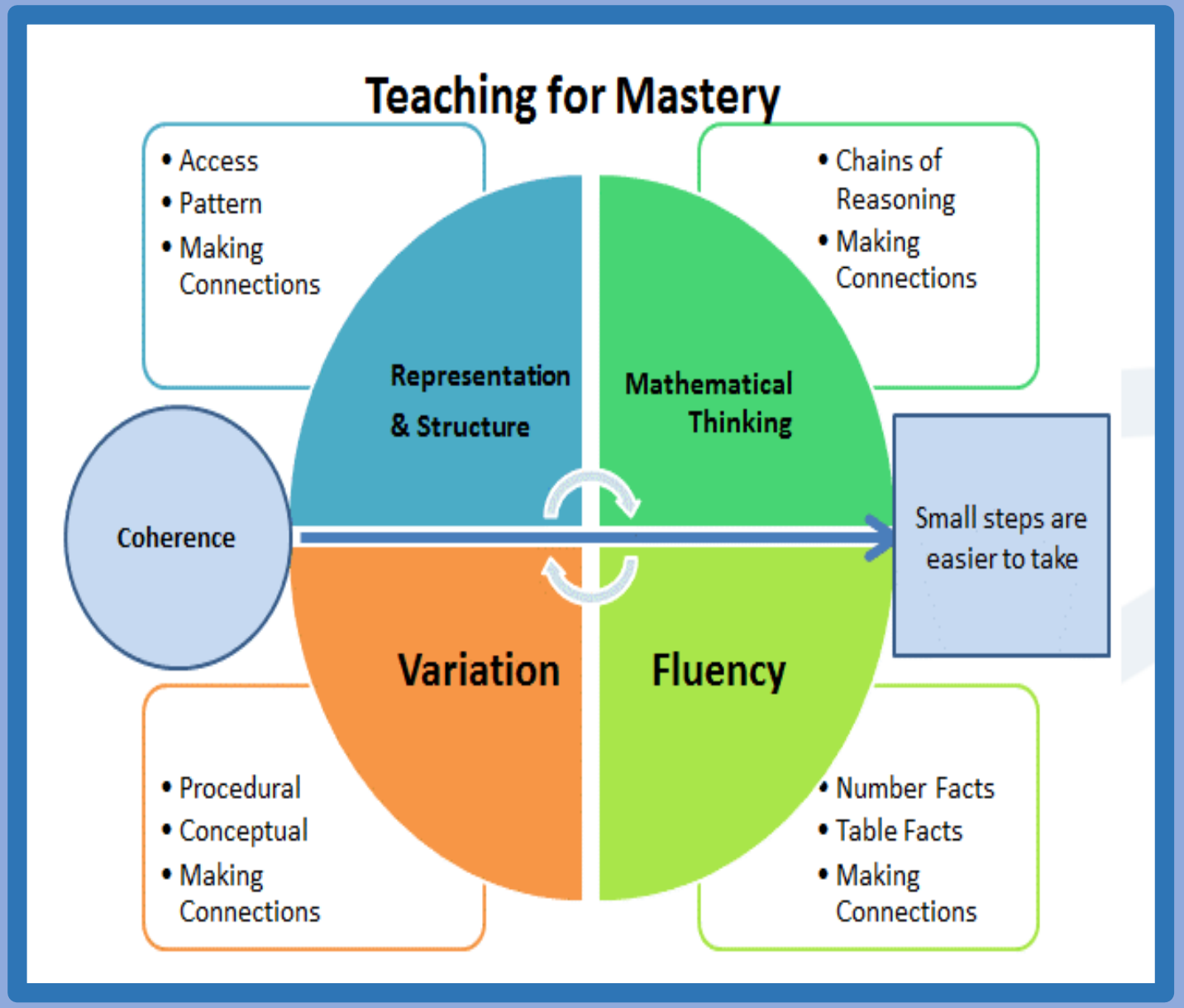
Implementation: How?

- Mathematics is taught explicitly, although may make relevant links with the creative curriculum
- We teach using a Teaching for Mastery approach which is well established throughout the school
- In EYFS, they following the 'Mastering Number' curriculum for explicit teaching, adult-led activities and continuous provision
- In KS1 & KS2, Kangaroo Maths is used to ensure coverage of the full curriculum, but teachers plan lessons carefully using a range of appropriate resources including CanDo Maths and NCETM resources among others
- We aim to teach a full Mathematics lesson every day, in every class. It is timetabled.
- We also teach a separate fluency session in KS1 4 days and week and in KS2 daily. These sessions are also timetabled.
- In KS1, the fluency lessons follow the 'Mastering Number' programme.
- In KS2, teachers use a variety of resources and use the sessions to build on key skills
- Our curriculum is based on our values: Enjoy – Enquire - Excel

Implementation: How?

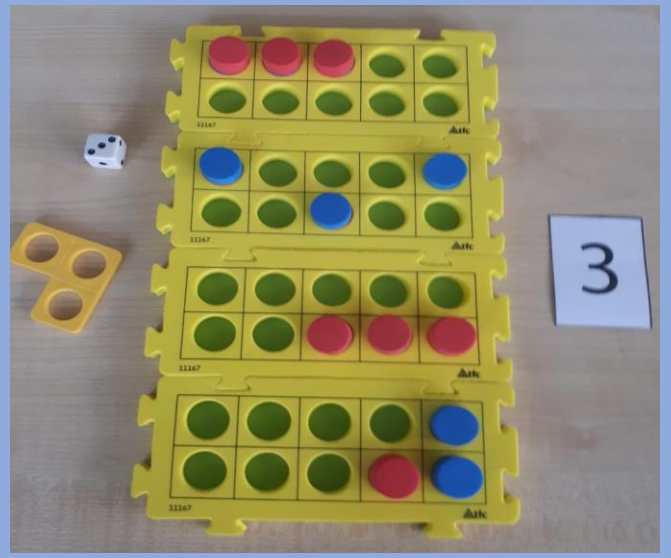
Teaching for mastery approach

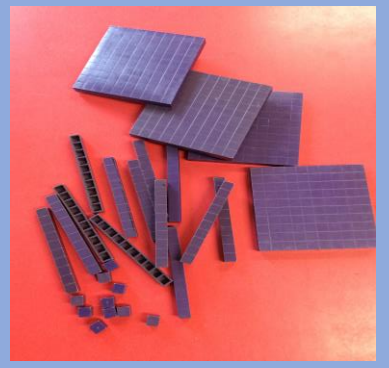
*A commitment that **ALL** pupils can and will achieve in mathematics by providing opportunities for all pupils to develop the depth and rigour they need to make secure and sustained progress over time.*



Implementation: How?

We use a range of practical resources throughout EYFS, KS1 & KS2. As a school we are well resourced for mathematics and teachers understand how to use them appropriately.

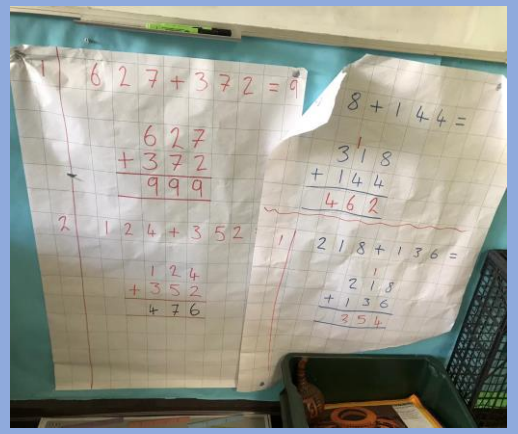


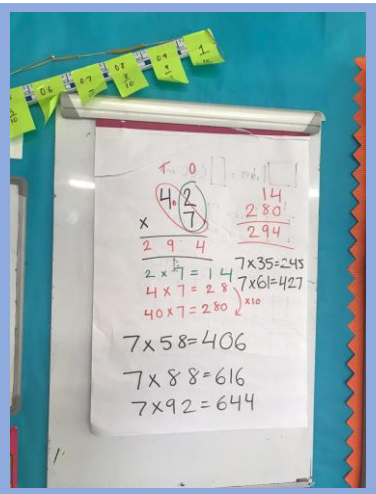


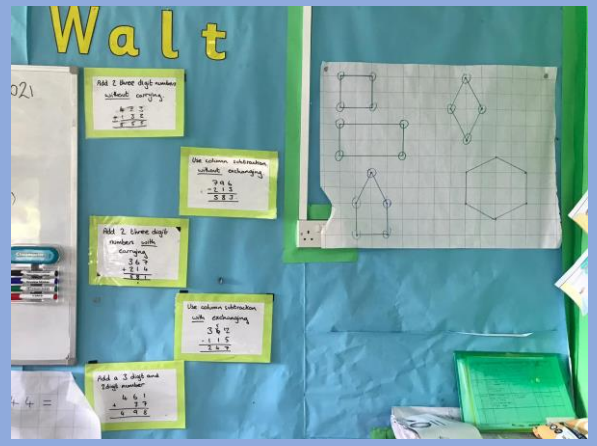
Implementation: How?

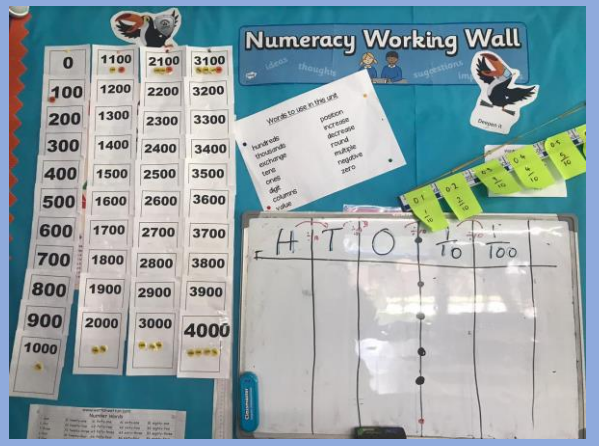
To stimulate interest, all classes have a Working Wall for Mathematics which may include:

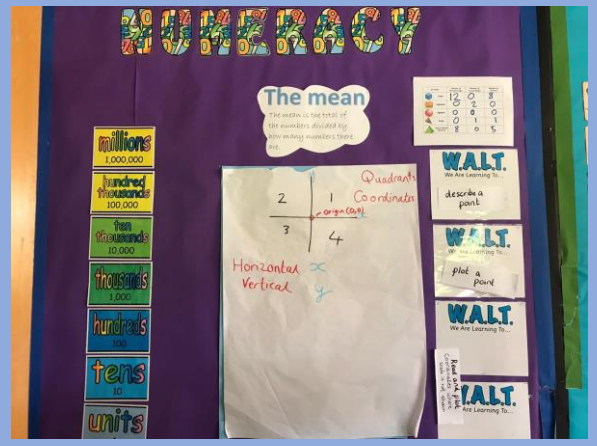
- Key vocabulary
- Important symbols
- Visual images
- Prompts
- Important facts
- Key representations











Implementation: How?

We use precise Mathematical vocabulary

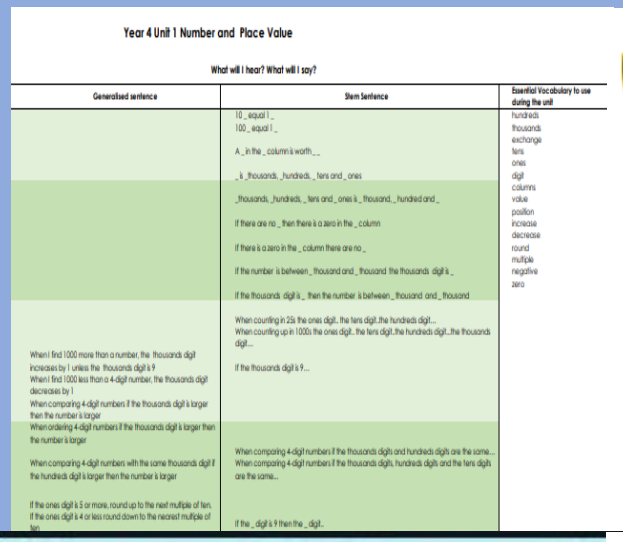
Stem Sentences (Yr 4 example)

The whole is divided into ten equal parts and ___ of them is / are shaded; this is ___ tenth (s) of the whole.

One tenth can be written as "0.1", so ___ tenths can be written as "0.___".

This is _____ and ___ tenths. We can also say _____ point ___ .

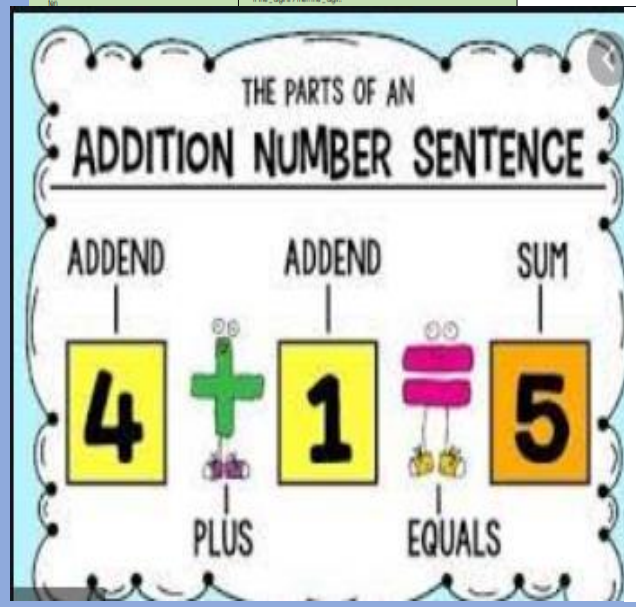
I say _____ -point- ___ tenth (s) but I think _____ and ___ tenth (s).

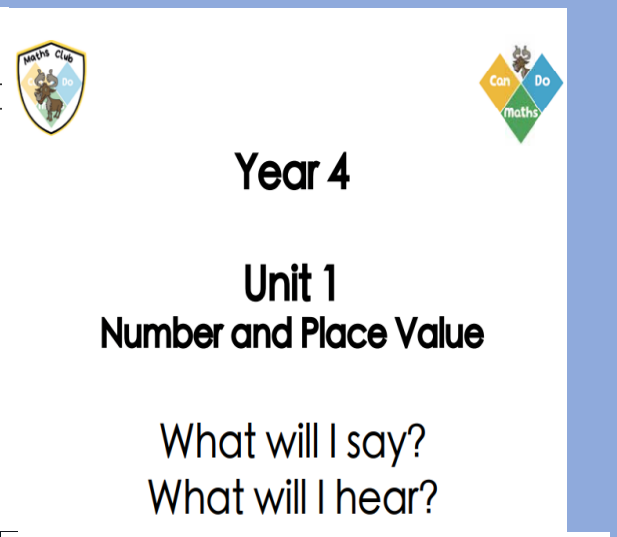


Year 4 Unit 1 Number and Place Value

What will I hear? What will I say?

Generalised sentence	Stem Sentence	Essential Vocabulary to use during the unit
	10 _ equal 1 _ 100 _ equal 1 _ A _ in the _ column is worth _ _ _ is _ thousands, _ hundreds, _ tens and _ ones	hundreds thousands exchange tens ones digit columns value position increase decrease round multiple negative zero
	_ thousands, _ hundreds, _ tens and _ ones is _ thousand, _ hundred and _ If there are no _ then there is a zero in the _ column If there is a zero in the _ column there are no _ If the number is between _ thousand and _ thousand the thousands digit is _ If the thousands digit is _ then the number is between _ thousand and _ thousand	
When I find 1000 more than a number, the thousands digit increases by 1 unless the thousands digit is 9 When I find 1000 less than a 4-digit number, the thousands digit decreases by 1 When comparing 4-digit numbers if the thousands digit is larger then the number is larger	When counting in 25s the ones digit, the tens digit, the hundreds digit... When counting up in 1000s the ones digit, the tens digit, the hundreds digit, the thousands digit... If the thousands digit is 9...	
When ordering 4-digit numbers if the thousands digit is larger then the number is larger When comparing 4-digit numbers with the same thousands digit if the hundreds digit is larger then the number is larger	When comparing 4-digit numbers if the thousands digits and hundreds digits are the same... When comparing 4-digit numbers if the thousands digits, hundreds digits and the tens digits are the same...	
If the ones digit is 5 or more, round up to the next multiple of ten. If the ones digit is 4 or less round down to the nearest multiple of ten	If the _ digit is 9 then the _ digit...	





Language focus

"10 hundreds is equal to 1 thousand."

Pupils must then be able to work out how many hundreds there are in other four-digit multiples of 100.

Figure 2: eighteen 100-value place-value counters in 2 tens frames

Language focus

"18 hundreds is equal to 10 hundreds and 8 more hundreds."

"10 hundreds is equal to 1,000."

"So 18 hundreds is equal to 1,000 and 8 more hundreds, which is 1,800."

Implementation: How?

Our Whole Class lessons start with positive mindset messages

Glenfall Primary School

YouCan Toucan – Classroom Beliefs

- Mistakes are valuable
- Everyone can learn maths to the highest level
- Questions are really important
- Depth is more important than speed
- Maths is about making connections

<u>Our positive mindset mascot</u>
'YouCan Toucan'

Implementation: How?

Whole Class lessons have a clear consistent structure in Y1-6

Slides may include:

- Key representations
- Problems for pupils to work through independently or together
- Stem sentences
- Opportunities for challenge
- Opportunities for reasoning

Teach it : What it is?

Do it - What it is ?

What it is not - Secure it..

Discuss it. Deepen It.

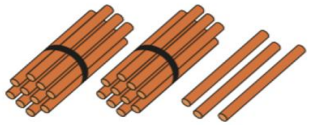
Review it : What have you learnt?

Implementation: How?

EXAMPLE SLIDES…

Theme: Numbers

Teach it : What it is?

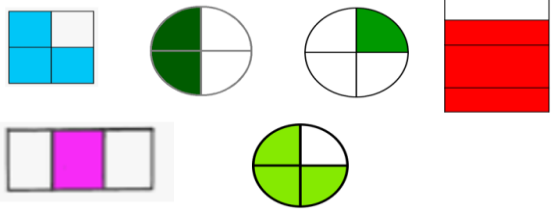


There are __ tens with a value of __ and __ ones with a value of __.

Theme: Fractions

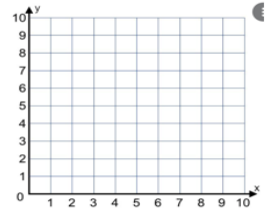
What it is not - Secure it…

Which of these show $\frac{3}{4}$ shaded?



Do it - What it is ?

What are the co-ordinates for this shape?



THINK:

How many sides?
Do the sides need to be even?

What do you notice?
What is the same ?
What it different?

SHAPE: Rectangle

Theme: Numbers

Discuss it. Deepen It.

True or false?

51 has a digit with a value of 1

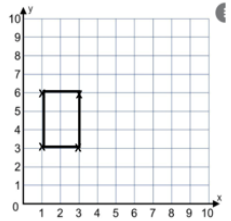
67 has a digit with a value of 60

29 has a digit with a value of 2

84 has a digit with a value of 40

Discuss it. Deepen It

Deepen it: Is this correct?
Coco wanted to create a square in her quadrant. Did she manage do to this successfully? Why?

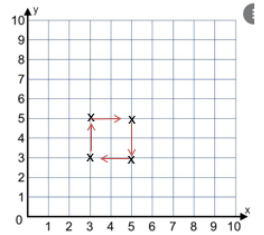


Do you agree or disagree ?
What shape is it ?
Could you give the co-ordinates to make it into a square ?

Theme: .....

Teach it : What it is?

How would you come up with co-ordinates for a shape?



1. Think about how many sides the shape has. **Square = 4**
How many co-ordinates does that mean? **Square = 4**
2. Then think do the sides need to be the same length each side? **Square = YES**
3. Where would you like to start plotting points? **(3,3)**
4. Start to work out where the next 3 points go.
5. Make sure you record your co-ordinates **(3,5) (5,5) (5,3)**

SHAPE: Square

What do you notice ?

Implementation: How?

Daily Fluency sessions in KS1 & KS2, plus extra for EYFS throughout the week

- EYFS: games, stories, songs, counting practice
- KS1: Mastering Number – composition, comparison, structure of addition and subtraction
- KS2: calculation : addition and subtraction, multiplication and division, times tables. Closing the gap.

Implementation: How?

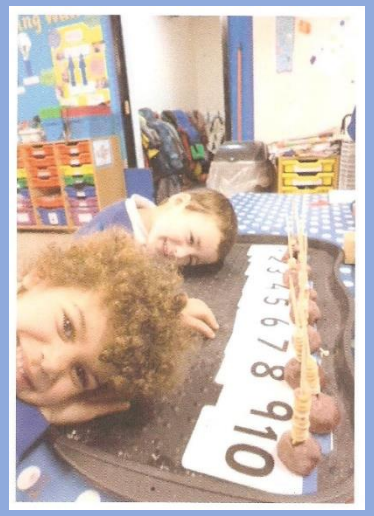
Carefully crafted lesson design slides : What a concept is and what it is not. Then deepen the understanding of it.

We use a range of resources for planning, carefully selecting questions and examples to support pupils with their understanding.

What do you notice ? What it is ? What it is not? What do you wonder ?

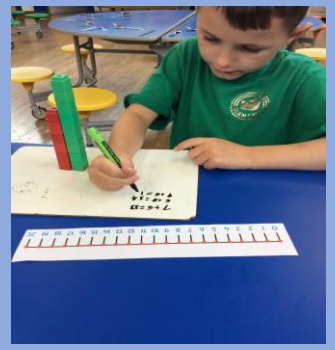
Implementation: How?

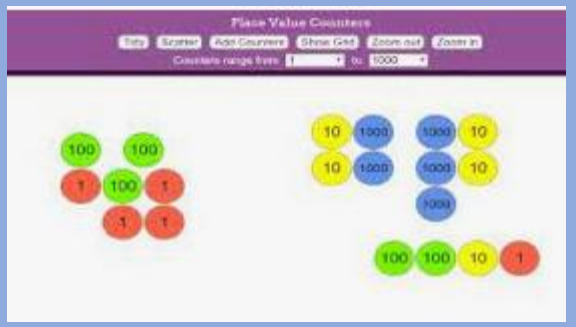
We encouragement enjoyment of Mathematics and support pupils in building secure foundations

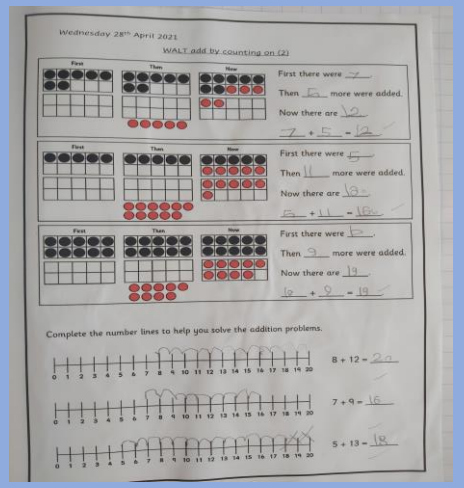


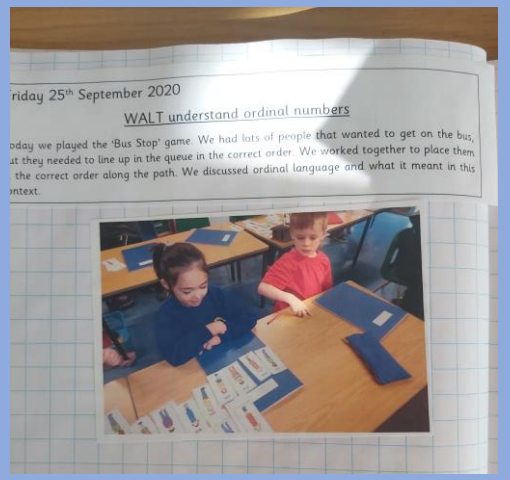
Implementation: How?

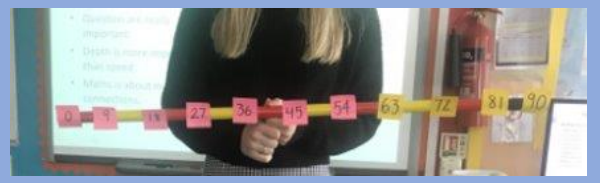
We plan opportunities for children to develop and demonstrate their mathematical skills in a range of ways and using appropriate representations

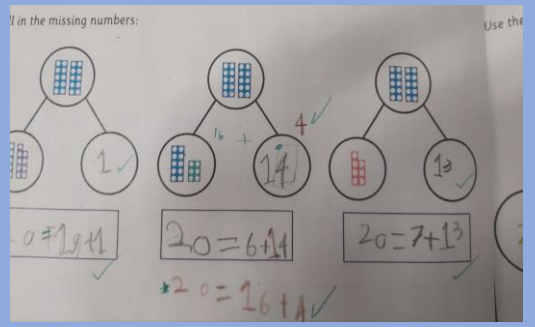








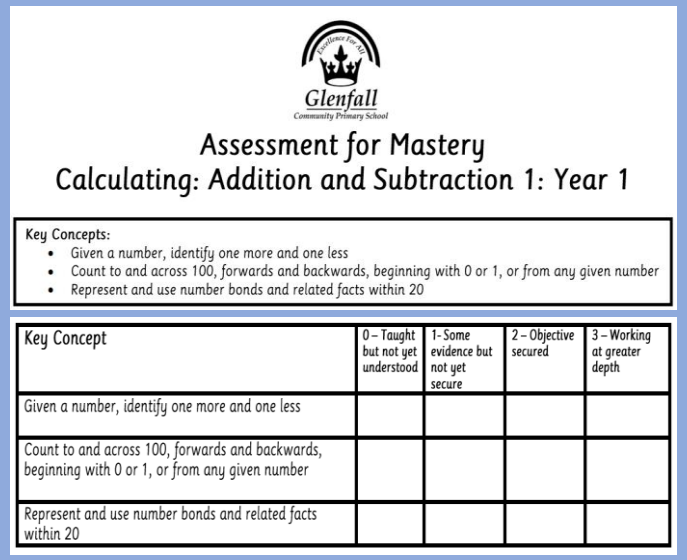




Implementation: How?

Children are assessed through Assessment for Learning strategies, end of unit assessments and statutory assessments

- **Completed after each unit taught in Mathematics**
- **Questions include Fluency, Reasoning, Problem Solving, Misconception/Difficulty Point and Application**
- **Questions cover each relevant National Curriculum Statement**
- **Final box at the end matches internal tracking system**
- **Response to assessment**

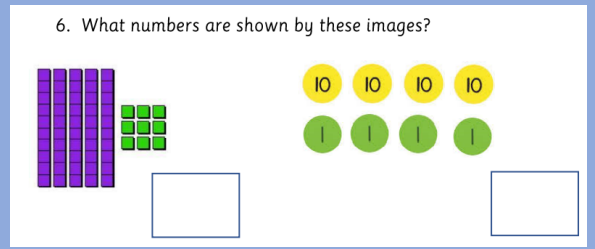


Glenfall
Community Primary School

Assessment for Mastery
Calculating: Addition and Subtraction 1: Year 1

Key Concepts:
- Given a number, identify one more and one less
- Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- Represent and use number bonds and related facts within 20

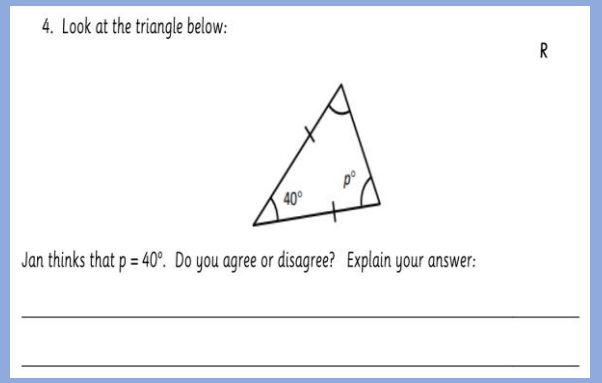
Key Concept	0 – Taught but not yet understood	1- Some evidence but not yet secure	2 – Objective secured	3 – Working at greater depth
Given a number, identify one more and one less				
Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number				
Represent and use number bonds and related facts within 20				



6. What numbers are shown by these images?

10 10 10 10

1 1 1 1

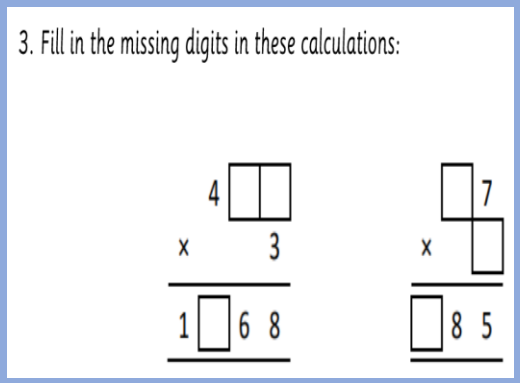


4. Look at the triangle below:

R

40° p°

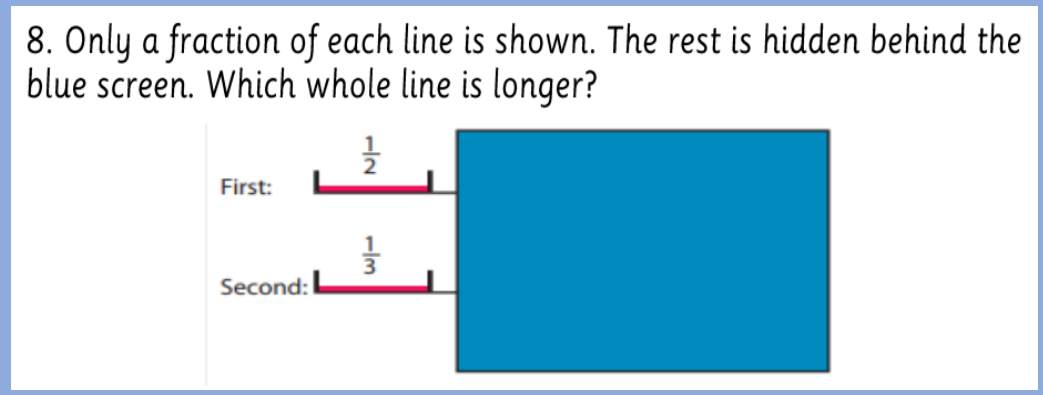
Jan thinks that p = 40°. Do you agree or disagree? Explain your answer:



3. Fill in the missing digits in these calculations:

4 □ x 3 = 1 □ 6 8

□ 7 x □ = □ 8 5



8. Only a fraction of each line is shown. The rest is hidden behind the blue screen. Which whole line is longer?

First: $\frac{1}{2}$

Second: $\frac{1}{3}$

IMPACT - evidence

At Glenfall, we have enquiring, motivated, resilient learners, who speak of their love of Mathematics, with enthusiasm, the majority of whom reach ARE.

Mathematics lessons are fun, packed with practical opportunities for enquiry and rich with mathematical vocabulary.

The school mindset is inspiring – both inside and outside.

CALCULATION POLICY - INTENT

An appreciation of number and number operations, which enable mental calculations and written procedures to be performed efficiently, fluently and accurately is key to children being successful in mathematics.

We aim for all children to be:

- able to recall quickly and accurately basic number facts

  (e.g. number bonds, multiplication and division facts)

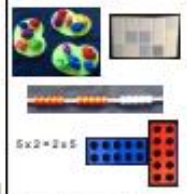
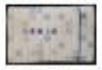
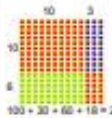
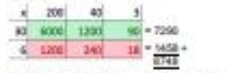
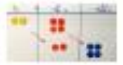
- fluent in applying quick, efficient written and mental methods of calculation.

CALCULATION POLICY - IMPLEMENTATION

- Before doing a calculation, all teachers and pupils look at a calculation and think *'What do I notice? 'and 'Can I do it in my head, with jottings or do I need to use a written method? '*
- All teachers use concrete and pictorial representations to teach conceptual understanding of mental and written calculation methods
- The Mathematics Curriculum prioritises time for developing conceptual understanding of calculation methods and learning facts (Maths Lessons)

CALCULATION POLICY

Multiplication

	1	2	3	4	5	6
Written Methods		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	Write and calculate mathematical statements for × using the x tables they know progressing to formal written methods.	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout 243 × 6 = 1458	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers 243 × 36 = 7290 + 8748 = 8748	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication 5172 × 38 = 41376 + 155160 = 196536
Developing conceptual understanding	2 frogs on each lily pad 	5 frogs on each lily pad 5 x 3 = 15  5 x 2 = 2 x 5 Build tables on counting stick Link to repeated addition 	If I know 10 x 8 = 80 then ...  So 13 x 4 = 10 x 4 + 3 x 4 Build tables on counting stick 	43 x 6 by partitioning 40 x 6 = 240 3 x 6 = 18 43 x 6 = 258 If I know 4 x 8 = 24 then 40 x 8 is ten times bigger. 40 x 60 is one hundred times bigger. 13 x 16 by partitioning  100 + 30 + 60 + 18 = 208 Build tables on counting stick 	Grid method linked to formal written method  If I know 4 x 8 then 0.4 x 0.6 is ten times smaller 0.4 x 0.6 is ten times smaller again. 	
With jottings **... or in your head ....**	Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations	Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers establish whether a number up to 100 is prime	Perform mental calculations, including with mixed operations and large numbers
Just know it!	Count in multiples of twos, fives and tens	Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.	Recall and use x and ÷ facts for the 3, 4 and 8 times tables.	Recall x and ÷ facts for x tables up to 12 x 12.	Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)	
Foundations	Count in 2s	2 x table	Review 2s, 5s and 10s	4s, 8s tables 10 times bigger	4s, 8s tables 100, 1000 times bigger	Multiplication facts up to 12 x 12
	Count in 10s	10 x table	4s table	3s, 6s and 12s tables	3s, 6s and 12s tables 10, 100, 1000 times smaller	Partition to multiply mentally
	Doubles up to 10	Doubles up to 20 and multiples of 5	Double two digit numbers	Double larger numbers and decimals	Double larger numbers and decimals	Double larger numbers and decimals
	Count in 5s	5 x table	8 x table	3s, 9s tables	3s, 9s tables	Multiplication facts up to 12 x 12
	Double multiples of 10	Count in 3s	3 x table	11s, 7 x tables	11s , 7 x tables Partition to multiply mentally	Partition to multiply mentally
	Count in 2s, 5s and 10s	2 s, 5 x and 10 x tables	6 x table or review others	6s, 12 x tables	6s, 12 x tables	Double larger numbers and decimals

CALCULATION POLICY - IMPACT

- All teachers are confident and skilled to teach mental methods (in your head or with jottings) and written calculation methods
- All children have a secure understanding of mental and written methods of calculation suitable for their stage of learning.
- All children choose appropriate calculation methods depending on the numbers.
- All children can recall, understand and make connections using facts suitable for their stage of learning.

CURRICULUM DAYS & WEEKS

We have had focus days and weeks for Mathematics including:

- Week of Inspirational Maths
- Pattern Week
- Money Week

MONITORING

Mathematics Subject Leaders complete termly reviews using the MER cycle process. This includes:

- **Observation of a lesson**
- **Staff questionnaires**
- **Pupil interviews**
- **Book looks**
- **Learning walks**
- **Report to SMT/Maths Governor**

STAFF DEVELOPMENT

We talk about Mathematics on INSET Days and at Staff Meetings.

Staff are provided with opportunities to engage with external CPD through the GLOW Maths Hub

Staff are motivated to improve their practice and provide the best possible provision for the children

Maths Subject Leaders regularly attend Local Authority Maths Subject Leader Meetings

Year 2 teachers attend training annually for end of KS1 Assessments & one has moderated for Mathematics for Gloucestershire Local Authority

LINKS WITH THE LOCAL MATHS HUB

- We have strong links with our local Maths Hub
- Our Headteacher is the Deputy Maths Hub Lead
- Our Maths Subject Leaders are the Assistant Maths Hub Lead and a Primary Mastery Specialist, and they have worked as Work Group Leads for the Hub running Work Groups on Early Years and Variation
- We have spoken at Mathematics conferences for the GLOW Maths Hub and the University of Gloucestershire, Maths Subject Leader Meetings and presented to and hosted Secondary GITEP Mathematics students
- We provide support to other schools as they work on developing a Teaching for Mastery approach in their own setting
- Staff in the school engage in CPD via the GLOW Maths Hub including: Specialist Mathematical Knowledge for Teaching Assistants, Sustaining Teaching for Mastery, Subject Knowledge, Collaborative Planning, Early Years and Continuity from Years 5-8 (Links with the Secondary School)
- Through this work, we collaborate with other schools on CPD
- We have hosted open mornings, inviting colleagues from schools from across Gloucestershire and Worcestershire in to see how Maths is done at Glenfall
- We have taken part in the England-China Shanghai Exchange as part of our involvement in the Maths Hub Projects