Challenge, Equality & Opportunity

Maths at Havannah First School

Mastery – What is it?

Mastery in Maths is being able to understand and **apply** knowledge to different contexts and situations.

It can also be **explaining** thought processes, as well as, **proving** and **giving reasons** for answers.

This approach aims to broaden children's understanding of a concept, enabling them to **use what they know in new situations**.

Stages of Mastery

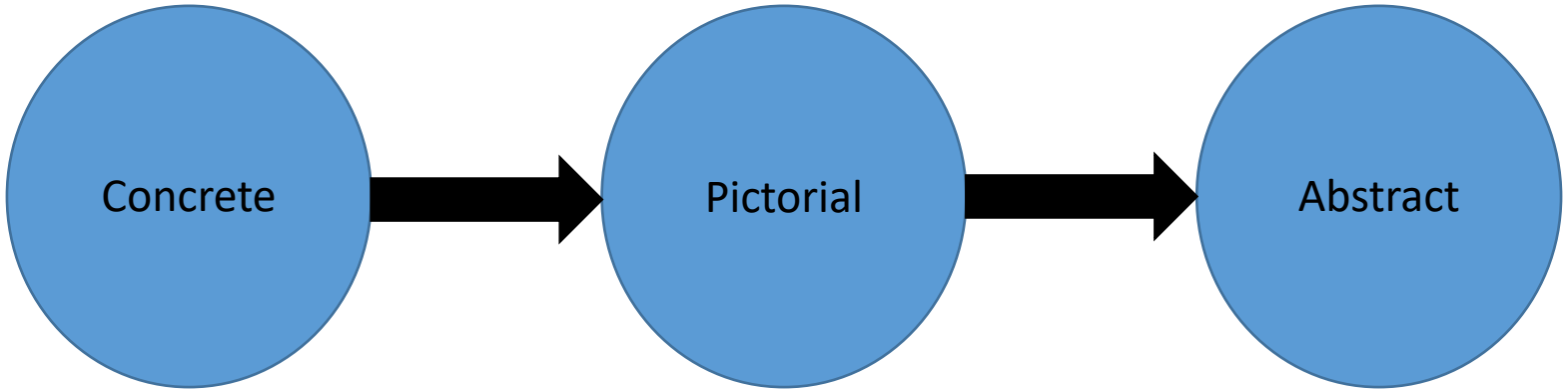
- **Fluency** in Maths happens when children can answer questions accurately using recall of Mathematical facts.

- **Reasoning** is when a child can explain what they have done and why or prove that something is or isn't correct.

- **Problem solving** is applying their knowledge and understanding to multi-step problems.

Stages of Teaching

- Maths learning should follow a process, moving through each stage when the child is ready.
- If the child is moved too quickly through the concrete and pictorial stage of their learning, this could affect understanding in later years.



- **How Maths is taught at Havannah**

- In KS 1 and 2, Maths is taught 5 times in a week.
- Schemes of learning are based on the White Rose Maths Schemes of Work and support our school's mastery approach to teaching and learning and are consistent with the aims and objectives of the National Curriculum.
- Number is at the heart of our schemes of learning and a significant amount of time is spent reinforcing number in order to build competency and allow and ensure children can confidently access the rest of the curriculum.
- We aim for children to stay within the required Key Stage so that children acquire depth of knowledge in each topic.
- Opportunities to re-visit previously learnt skills are built into planning.
- Children can progress through schemes of learning as a whole group, encouraging children of all abilities to support each other in their learning.
- The vast majority of children progress through the curriculum at a similar pace.
- Questioning, marking and feedback of work helps to identify those children who need further support, provides opportunities to address misconceptions and also allows children to make corrections or complete next step challenges. This allows the vast majority of children to continue to work at a similar pace.

Long Term Plan for Maths

YEAR 3

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition & Subtraction					Number: Multiplication and Division			Consolidation Assessment
Spring	Number: Multiplication and Division			Measurement: Length and Perimeter			Number: Fractions			Measurement: Mass and Capacity		Consolidation Assessment
Summer	Number: Fractions		Measurement: Money		Measurement: Time			Geometry: Properties of Shape		Statistics		Consolidation Assessment

Small Steps in Maths

Maths Curriculum Map – Year 3

Core Curriculum Small Steps	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Number: Place Value • Represent numbers to 100 • Partition numbers to 100 • Number line to 100 • Hundreds • Represent numbers to 1,000 • Partition numbers to 1,000 • Flexible partitioning of numbers to 1000 • Hundreds, tens and ones • Find 1, 10 or 100 more or less • Number line to 1,000 • Estimating on a number line to 1,000 • Compare numbers to 1,000 • Order numbers to 1,000 • Count in 50s **Number: Addition and Subtraction** • Apply number bonds within 10 • Add and subtract 1s • Add and subtract 10s • Add and subtract 100s • Spot the pattern • Add 1s across a 10 • Add 10s across a 100 • Subtract 1s across a 10 • Subtract 10s across a 100 • Make connections • Add two numbers (no exchange) • Subtract two numbers (no exchange) • Add two numbers (across a 10) • Add two numbers (across a 100)	**Number: Addition and Subtraction** • Subtract two numbers (across a 10) • Subtract two numbers (across a 100) • Add 2-digit and 3-digit numbers • Subtract a 2-digit number from a 3-digit number • Complements to 100 • Estimate answers • Inverse operations • Make decisions **Number: Multiplication and Division** • Multiplication - equal groups • Use arrays • Multiples of 2 • Multiples of 5 and 10 • Sharing and grouping • Multiply by 3 • Divide by 3 • The 3 times-table • Multiply by 4 • Divide by 4 • The 4 times-table • Multiply by 8 • Divide by 8 • The 8 times-table • The 2, 4 and 8 times-tables	**Number: Multiplication and Division** • Consolidate 2, 4 and 8 times tables • Compare statements • Related calculations • Multiply and divide 2 digit by 1 digit • Scaling • How many ways? **Measurement: Length and Perimeter** • Measure length (m) • Equivalent lengths m, cm and mm • Compare lengths • Add and subtract lengths • Measure and calculate perimeter	**Number: Fractions** • Make equal parts • Recognise and find half, quarter and third • Unit and non-unit fractions • Equivalence of ½ and 2/4 • Count in fractions **Measurement: Mass and Capacity** • Compare and measure mass • Add and subtract mass • Compare volume • Measure and compare capacity • Add and subtract capacity • Temperature	**Number: Fractions** • Making the whole • Count in tenths • Tenths as decimals • Fractions on a number line • Fractions of a set of objects • Equivalent fractions • Compare and order fractions • Add and subtract fractions **Measurement: Money** • Convert pounds and pence • Add and subtract money • Give change **Measurement: Time** • Clock, half past, quarter to and quarter past • Months and years • Hours in a day • Telling the time to 5 minutes and the minute • Using am and pm • 24 hour clock • Find and compare durations • Start and end times • Measuring time in seconds	**Geometry: Properties of Shape** • Turns and angles • Right angles in shapes • Compare angles • Draw accurately • Horizontal, vertical, parallel and perpendicular • Recognise and describe 2D and 3D shapes • Make 3D shapes **Statistics** • Make tally charts • Draw and interpret pictograms (2,5 and 10) • Pictograms, bar charts, tables
Vocabulary introduced in Year 3	**Number and Place Value:** numbers to 1,000 **Addition and subtraction:** column addition and subtraction **Fractions:** numerator, denominator, unit fraction, non-unit fraction, compare and order, tenths **Measurement:** leap year twelve-hour/24- hour clock, am/pm, century roman numerals I-XII mm **Multiplication and Division:** count in multiples of 4, 8 and 11, product, scale up **Geometry (Position and Direction):** greater/less than 90 degrees orientation (same orientation, different orientation), north, south, east, west **Geometry (Properties of Shape):** horizontal, vertical, perpendicular and parallel lines. perimeter hemi-sphere, prism, semi-circle **Statistics:** chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes diagram					

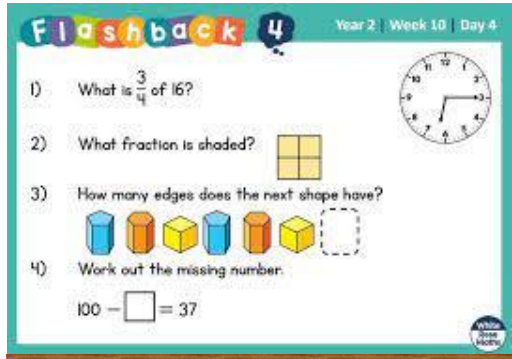
What does Maths Mastery look like in our lessons?

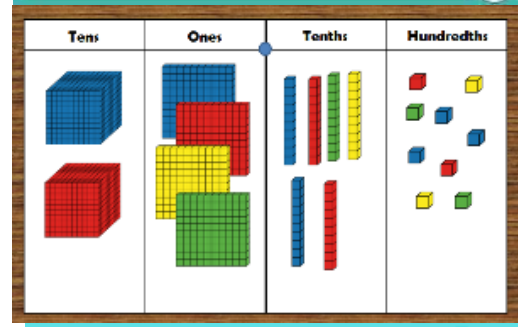
- We break the learning down into ‘thinkable’ chunks or **small steps**. We ensure that each step is mastered before moving on.
- We **revisit** and **build** on **previous** learning, developing **fluency**.
- We use **representations** **and** **equipment** to draw out mathematical understanding.
- We provide opportunities to **reason** and make **connections** – this helps pupils to remember.
- We **include** all learners.

A typical Maths lesson at Havannah First School

Each KS1 and 2 lesson typically follows the following format:

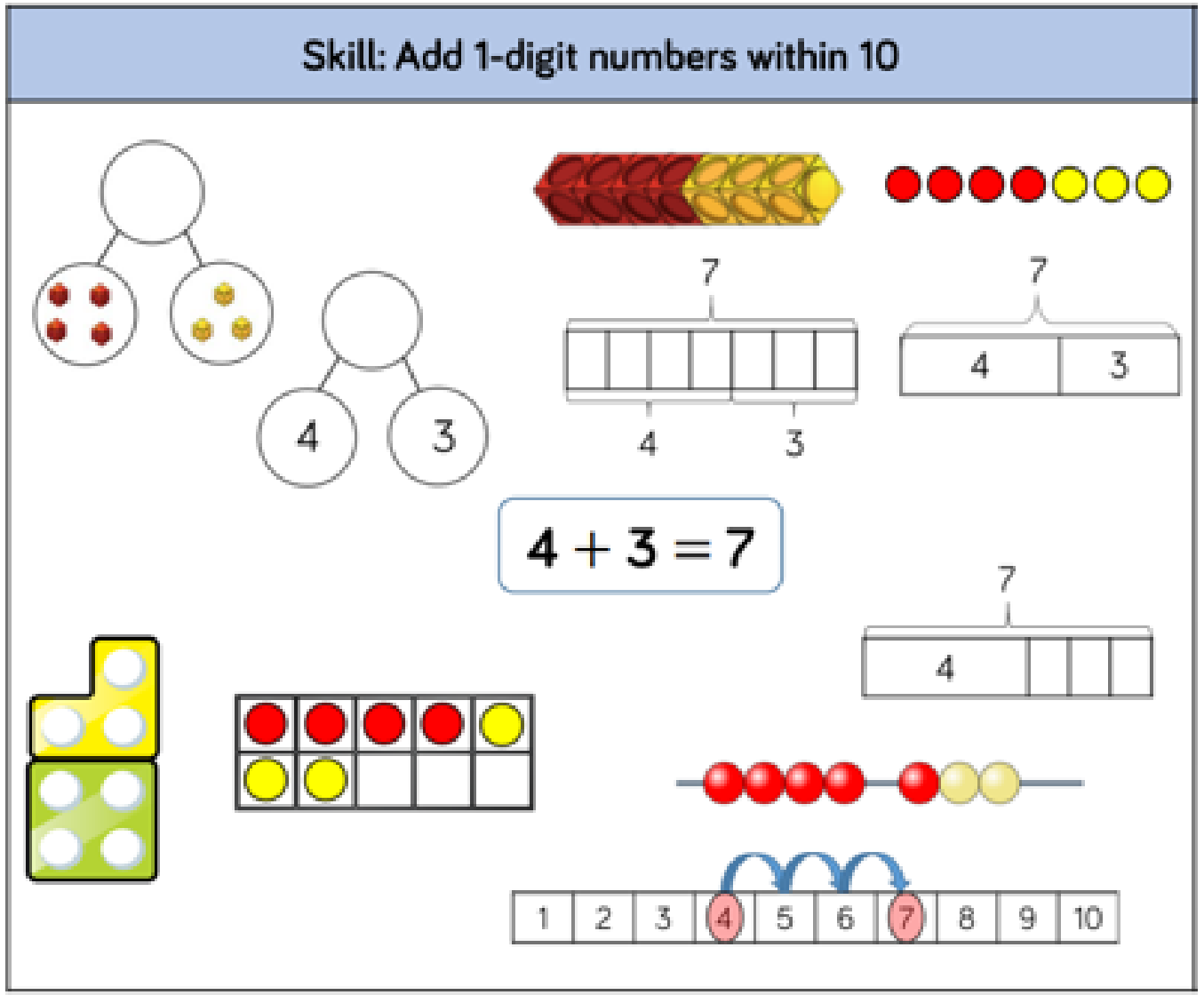
1. Flashback 4 (Daily retrieval – questions based on last lesson, last week, two weeks ago and further back)
2. A starter activity – practice skills needed for main activity and an introduction to key vocabulary.
3. A talk activity – what do the children know. Building on previous knowledge.
4. An open questioning task - to engage all learners (discussion of strategies)
5. A misconception question – a question that shows a common misconception related to the small step.
6. Whiteboard work – a range of questions which encourages reasoning/strategies – e.g. How do you know? What's the same and what's different, missing lengths or representations, True or False etc…
7. Independent Practice – Fluency/Reasoning and Problem-Solving questions in book.
8. Recap of lesson/Self marking and discussions.



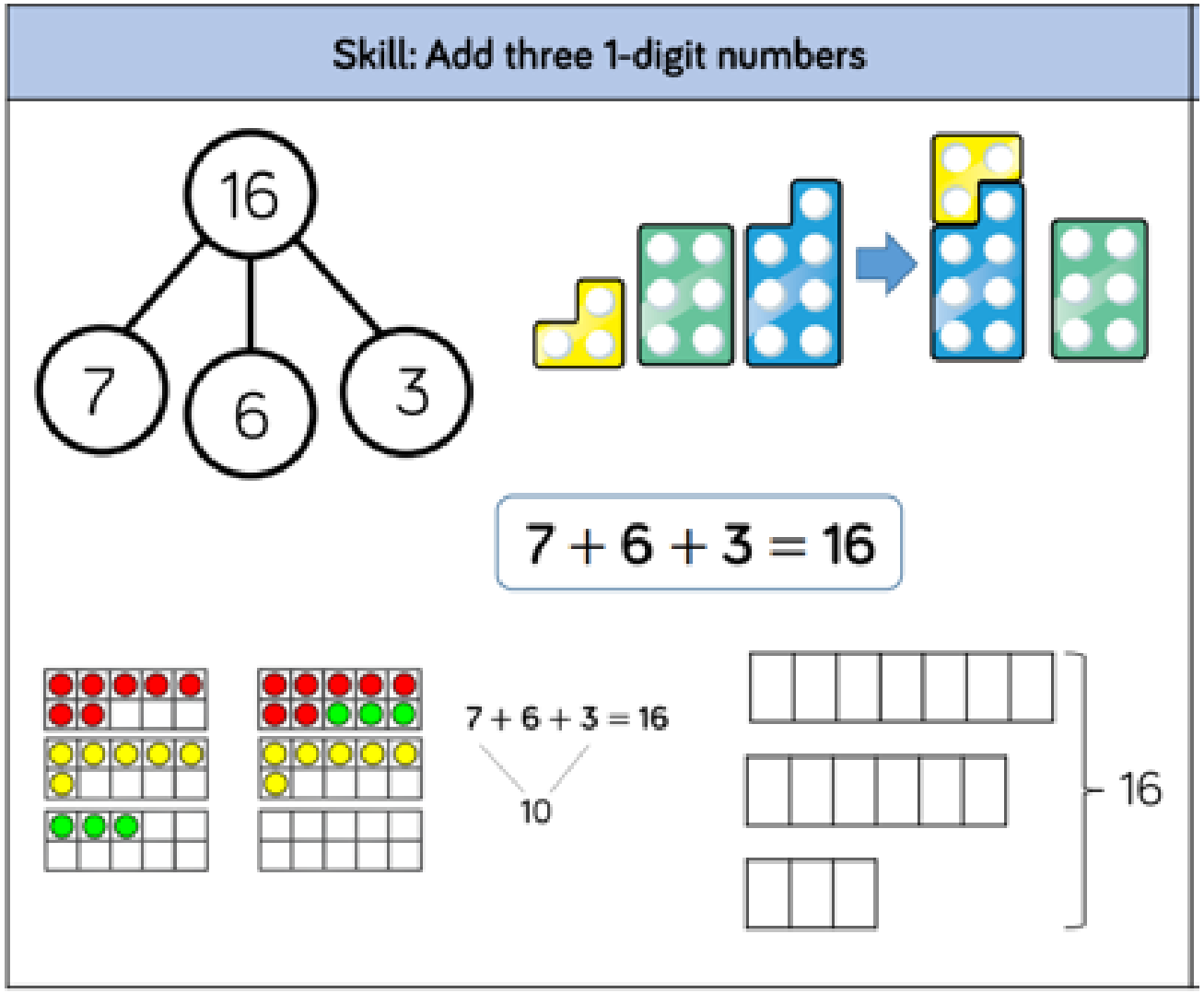




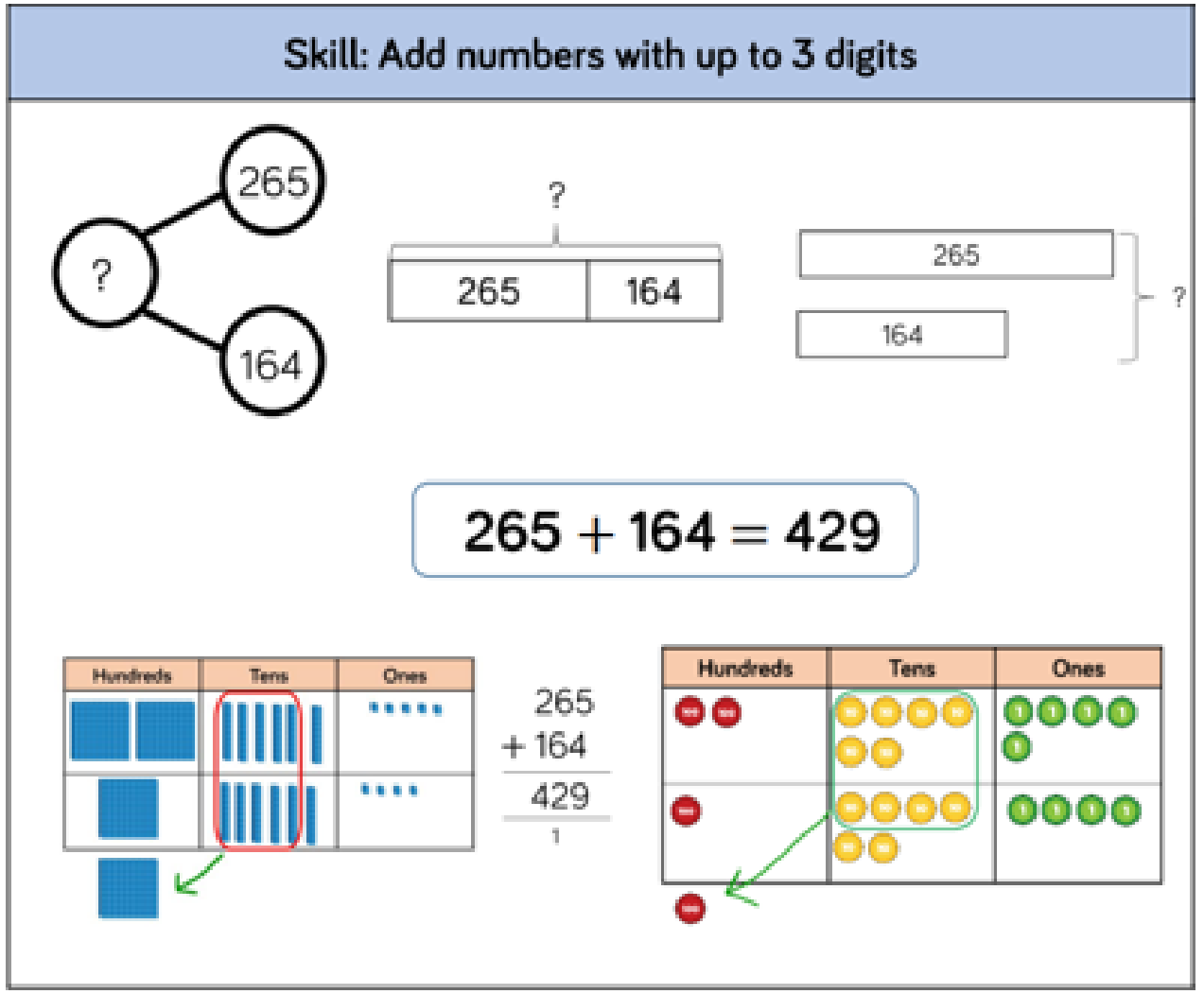
Example of Year 1 – teaching strategies for adding 1-digit numbers within 10



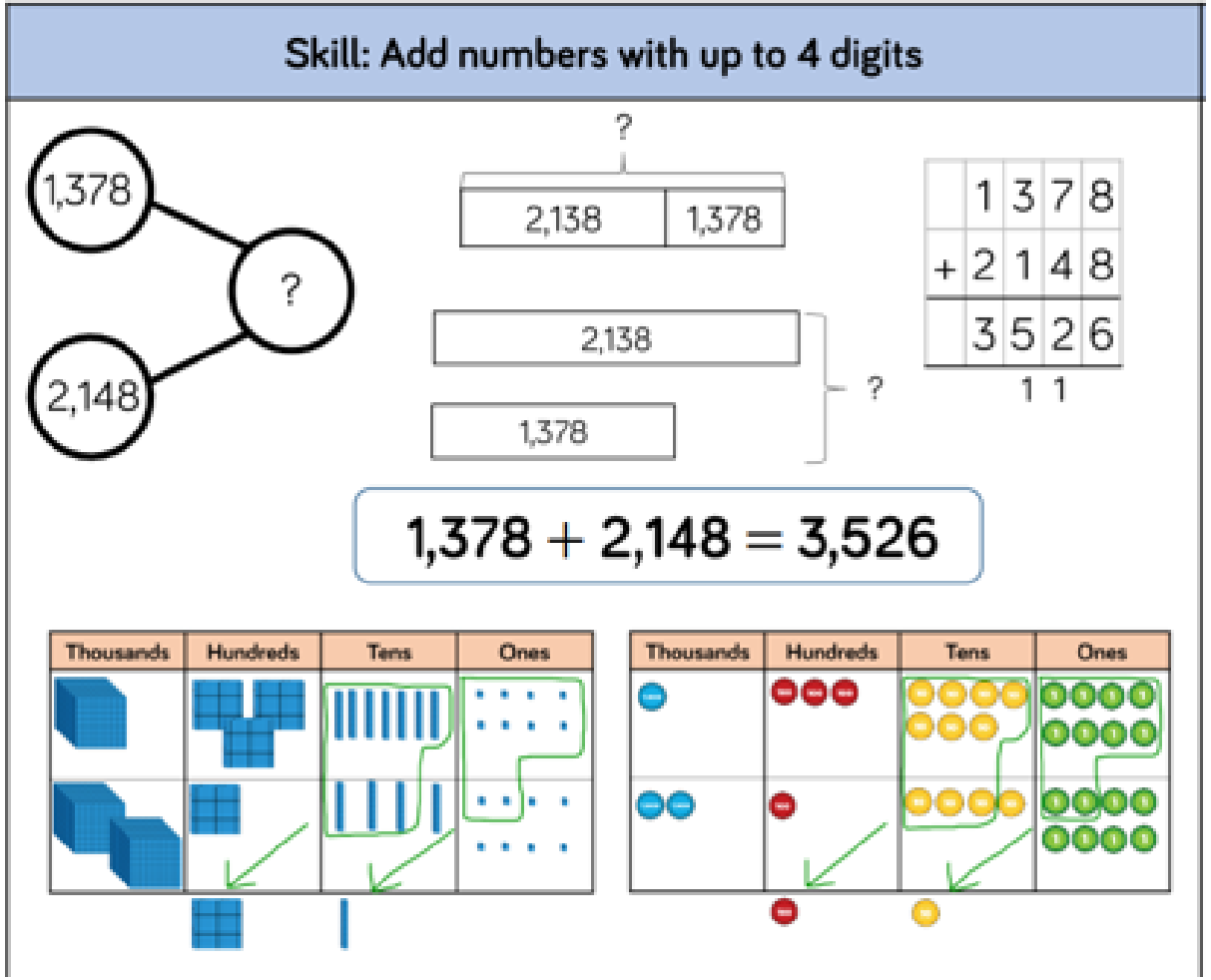
Example of Year 2 – teaching strategies for adding three 1-digit numbers



Example of Year 3 – add numbers with up to 3 digits

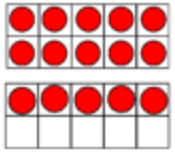


Example of Year 4 – add numbers with up to 4 digits

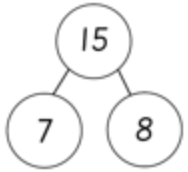


Key Representations

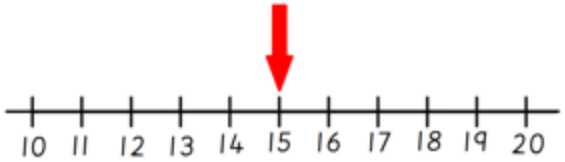
Tens frame



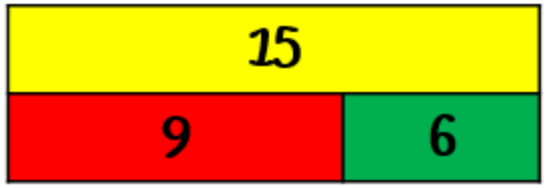
Part-whole model



Number line



Bar model



Place value grid and counters



Embedded and understood in KS1 and built on in KS2

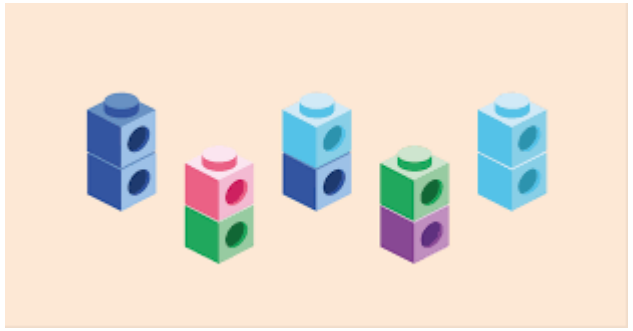
Manipulatives we use in school to aid our learning

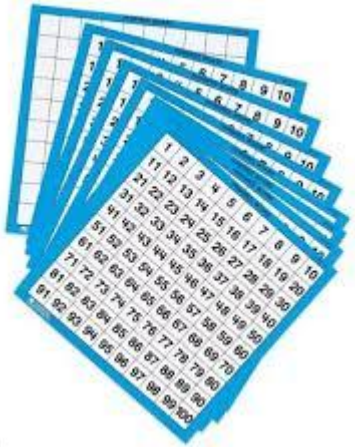


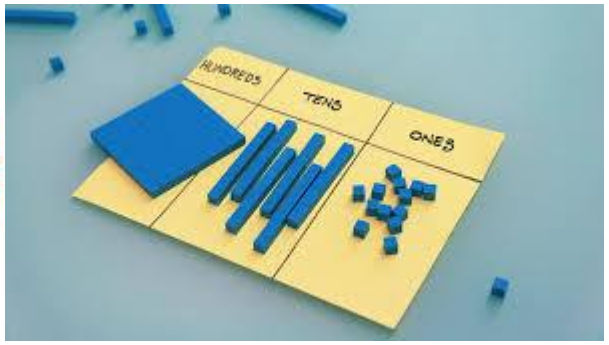


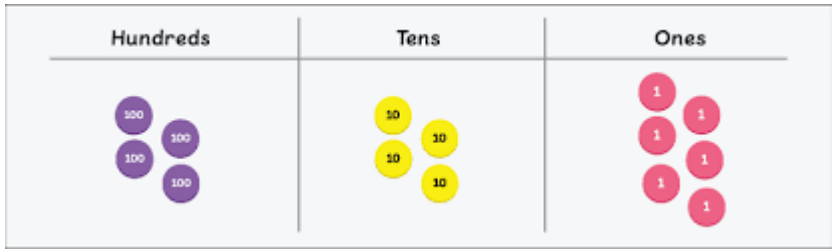












Multiplication Table

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

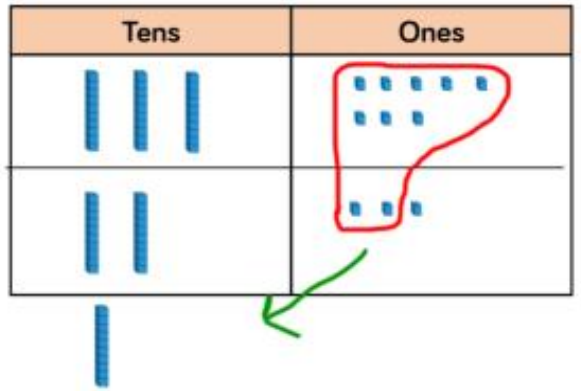


Havannah First School

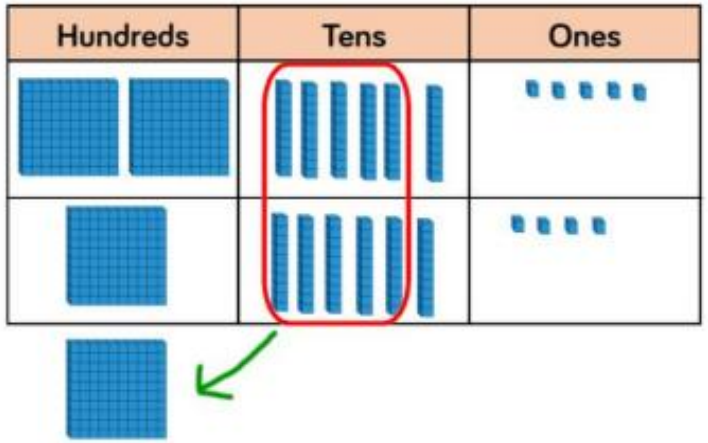
Written Methods

The early stages of the written methods for addition, subtraction and multiplication are introduced in Year 3 and developed further in Year 4.

Base 10/Dienes (addition)

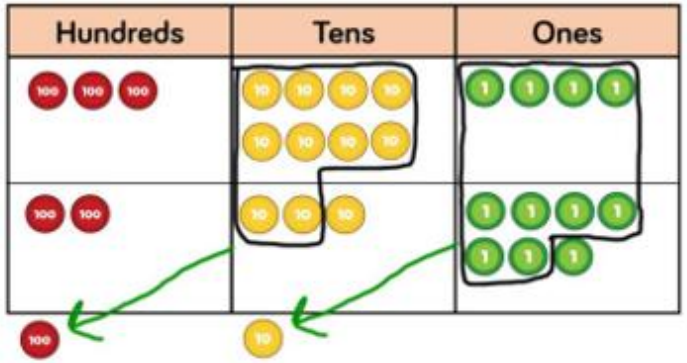


$$\begin{array}{r} 38 \\ +\ 23 \\ \hline 61 \\ \hline 1 \end{array}$$



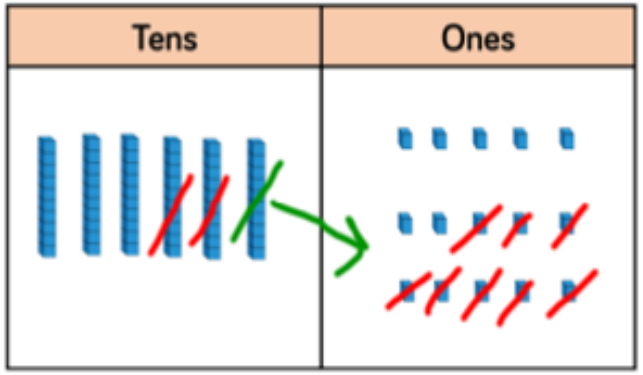
$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ \hline 1 \end{array}$$

Place Value Counters (addition)



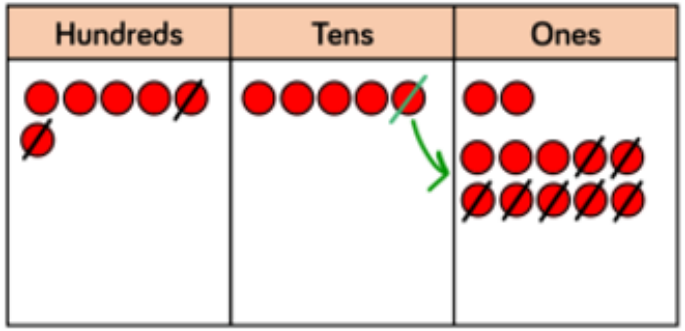
$$\begin{array}{r} 384 \\ +\ 237 \\ \hline 621 \\ \hline 1\ 1 \end{array}$$

Base 10/Dienes (subtraction)



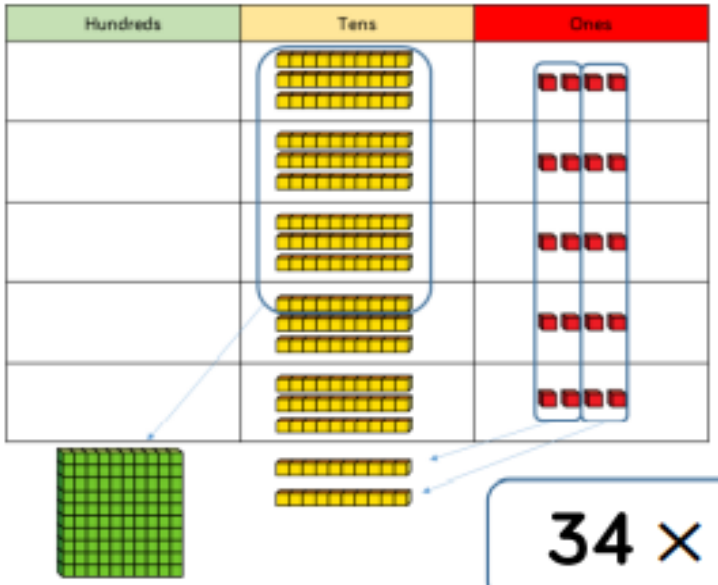
$$\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 28 \\ \hline 37 \end{array}$$

Place Value Counters (Subtraction)



$$\begin{array}{r} {}^{4}\not{6}\,{}^{1}\not{5}2 \\ -\ 207 \\ \hline 445 \end{array}$$

Skill: Multiply 2-digit numbers by 1-digit numbers



	H	T	O	
		3	4	
×			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	

$$34 \times 5 = 170$$

	H	T	O	
		3	4	
×			5	
	1	7	0	
	1	2		



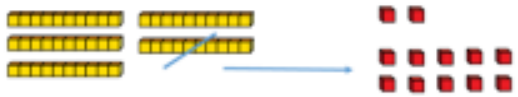
Year: 3/4

Teachers may decide to first look at the expanded column method before moving on to the short multiplication method.

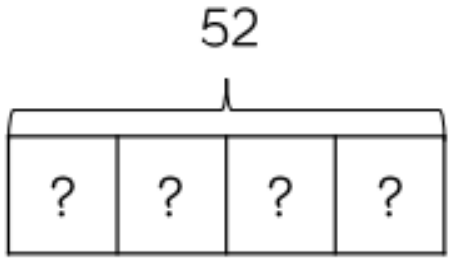
The place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.

Skill: Divide 2-digits by 1-digit (sharing with exchange)

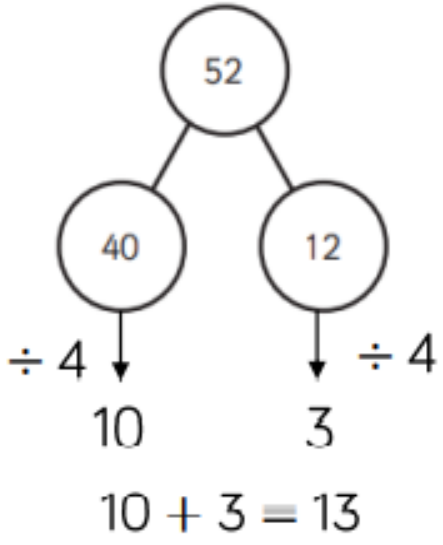
Year: 3/4

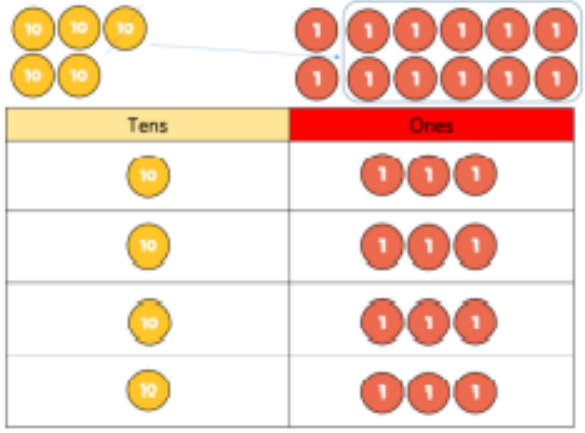


Tens	Ones



52 ÷ 4 = 13





Tens	Ones
10	1 1 1
10	1 1 1
10	1 1 1
10	1 1 1

When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones.
Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.



Helping your child at home…

- Have a positive mindset about Maths!
- Use maths talk everyday – two easy concepts to develop with your children are doubling/halving and adding/subtracting. Again, you could use physical objects such as food to reinforce this. It's as simple as asking your child to count the number of chicken nuggets or peas (or any other food!) on their plate at dinner time. and then you can ask them things like:
- "If I doubled the number of chicken nuggets on your plate right now, how many would you have?"
- "If I ate half the peas on your plate for you, how many would you have left?"
- "If we added all of my chicken nuggets to your chicken nuggets, how many would we have altogether?"
- Point out the Maths is all around us in everyday life. Include your child in activities involving numbers and measuring, such as shopping, cooking and travelling – telling the time, managing money etc...
- Games are a great way to bond with your children, but also many games use mathematical and logical skills that your children will need in later life. Even a simple jigsaw puzzle helps children to develop logical and spatial awareness skills. Furthermore, games like snakes and ladders enable children to count the rolls of the dice, which helps develop their counting skills
- When you look around, everything is made out of shapes. So why not encourage your children to learn the names of shapes when you're out and about to entertain them? They could identify car wheels as circles, windows as rectangles and even tiles as hexagons or whatever shape they may be!

- Encourage your child to use the computer for educational purposes – have a look on our school website for suggested websites to visit.

- Find out more about our work on the school website or at : www.whiterosemaths.com

- Download the White Rose '1-Minute Maths' app – great for fluency in number facts and FREE.

- As everybody knows, it's essential for children to learn their times tables in order to access harder maths questions. This is an easy thing for parents to practise with their children - sneak it in when they're bored! Make car journeys go by faster, or distract them on the bus by asking times tables questions. Challenge them to say their times tables backwards if they get bored of reciting them.
- Access Times Tables Rockstars in Years 3 and 4



- If you find that your child needs to challenge themselves more, or gets bored easily. Explore websites such as NRICH (http://nrich.maths.org/) or Transum (http://www.transum.org/). There is also a huge range of resources from the BBC https://www.bbc.co.uk/bitesize/subjects/zv7dcqt

Thank you for attending – if you have any questions then please do get in touch with the class teacher, Mr Burnett, our Maths Lead or visit the curriculum section on our website and follow the links to maths.