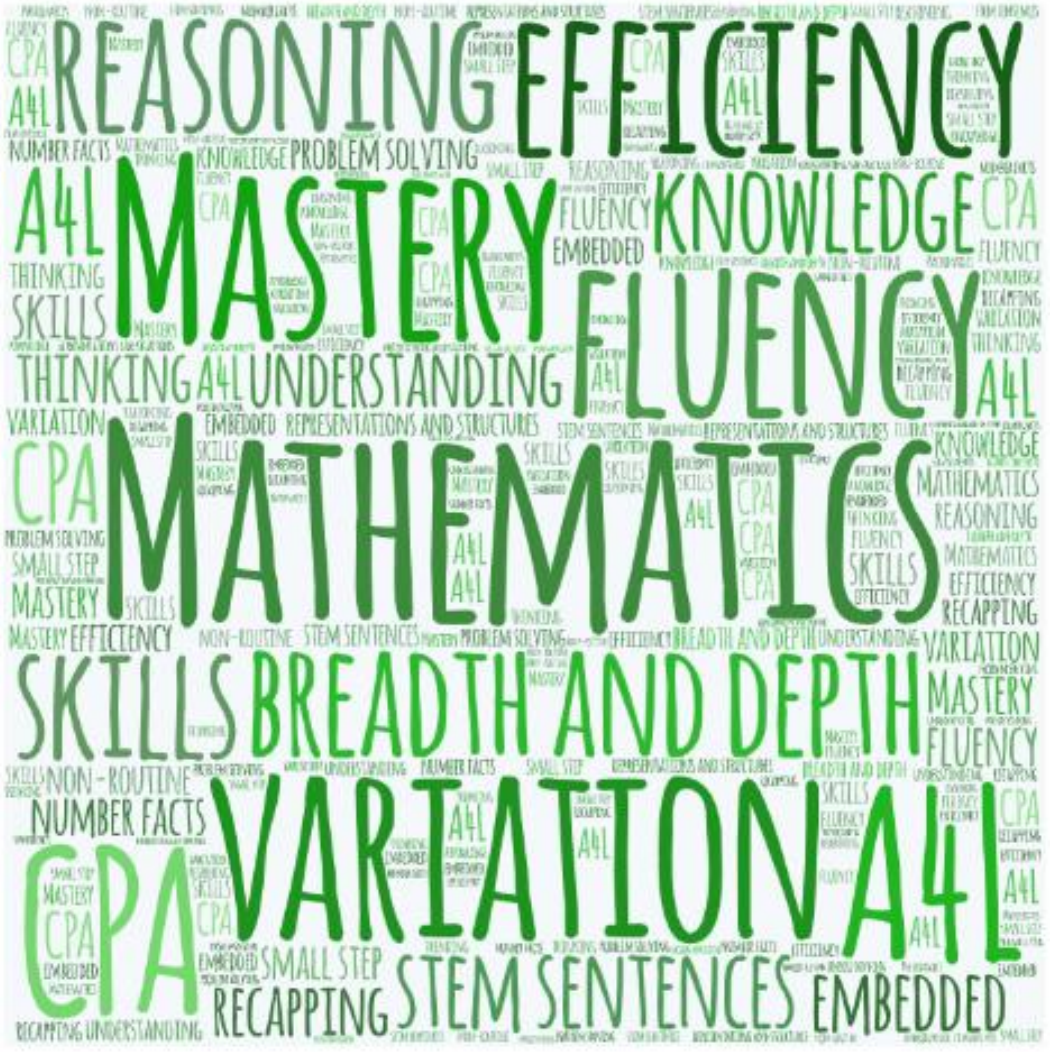
Mathematics and mastery at St Mark's



Our aims are for children to master maths by…

…recall important number and concept facts

…be fluent in number, choosing the most efficient ways to solve problems

…take risks, be resilient and be enthused by challenge

…enjoy their Maths lessons

…feel like they can succeed and make progress

…have a deep and broad understanding of the curriculum

…be able to apply their knowledge in both Maths and other areas of the curriculum

…be able to reason Mathematically by explaining and proving

…be able to make connections and links between different areas of Maths

…have a secure conceptual understanding of ideas

Developing Mastery in Maths at St. Mark's

Our vision for Maths

The journey of a learner of Maths at St Mark's

All the resources for Maths are located:

- White Rose Website
- NCETM Mastery PD materials
- Testbase (for pitch and expectations)
- System: Curriculum Teams/Maths
- Concrete resources in class or Beehive
- Display: calculation posters, Number Sense strategies, number lines, gattegno charts etc

What we expect to see in a great Maths lesson

- The ideologies of TfM used in lessons (fluency, mathematical thinking, variation, coherence and, variation and structure)
- Enthusiasm and engagement from the children, and yourself!
- Access to problem solving and reasoning for ALL
- Differentiation by support, resources, time and expectations as opposed to task. Same opportunities for MOST
- Visual and/or concrete resources to support conceptual understanding
- Use of verbal and written stem sentences in lessons and intelligent practice
- High quality mathematical language
- Children explaining their maths thinking as standard practice

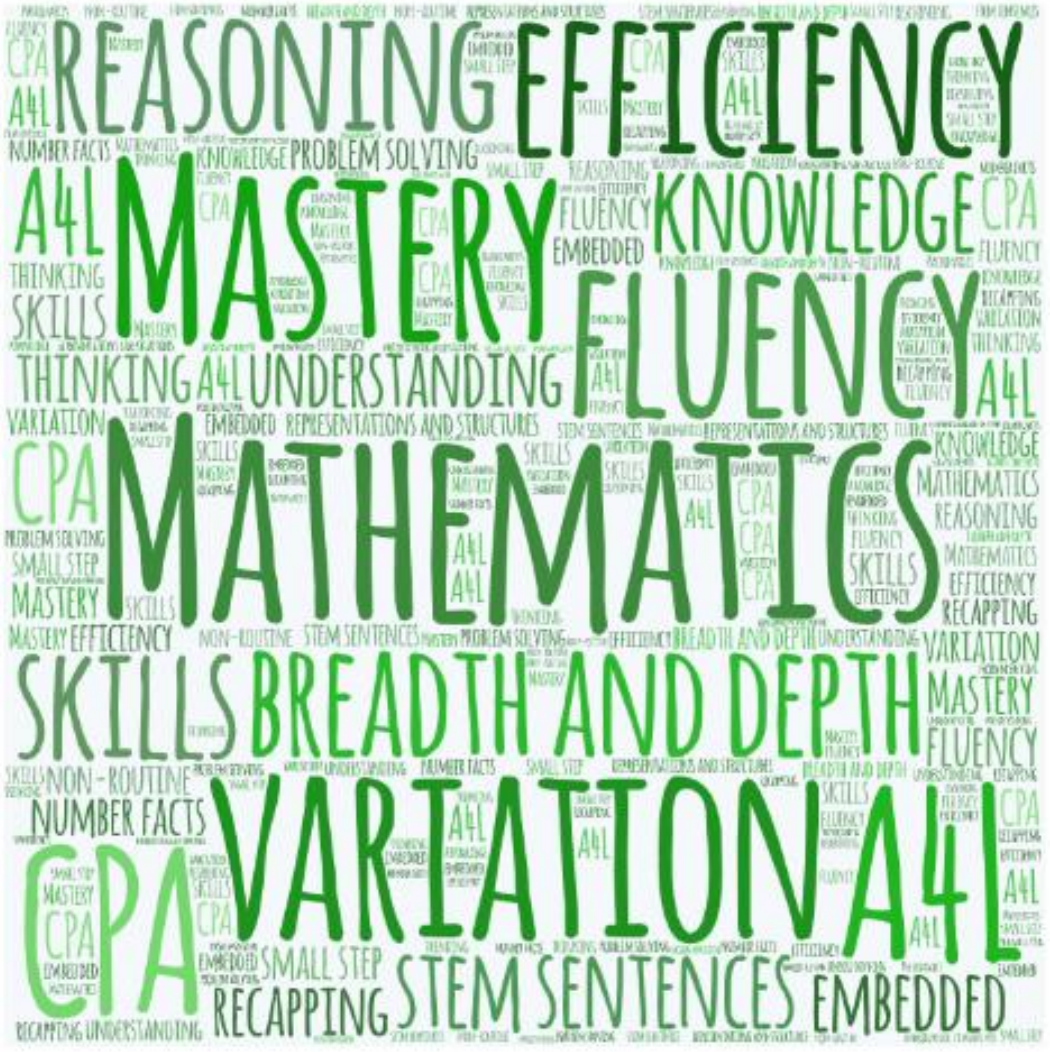
3 top tips for great Maths teaching

- Know the maths journey and the small steps within it including prior knowledge, skills and understanding. Small steps = successful learners
- Include non-routine practice
- Make connections across different areas of Maths so the strands are not seen as discrete areas

Also remember...

- Flashback maths
- Rockstars and Numbots
- Number sense (intervention)
- Rich investigation lessons!
- Gap analysis to inform teaching

Mathematics and mastery at St Mark's



What is mastery?

A mathematical concept or skill has been mastered where, through exploration, clarification, practice and application over time, a person can represent it in multiple ways, has the mathematical language to be able to communicate related ideas and can think mathematically with the concept so that they can independently apply it to a totally new problem in an unfamiliar situation.

- Drury 2014

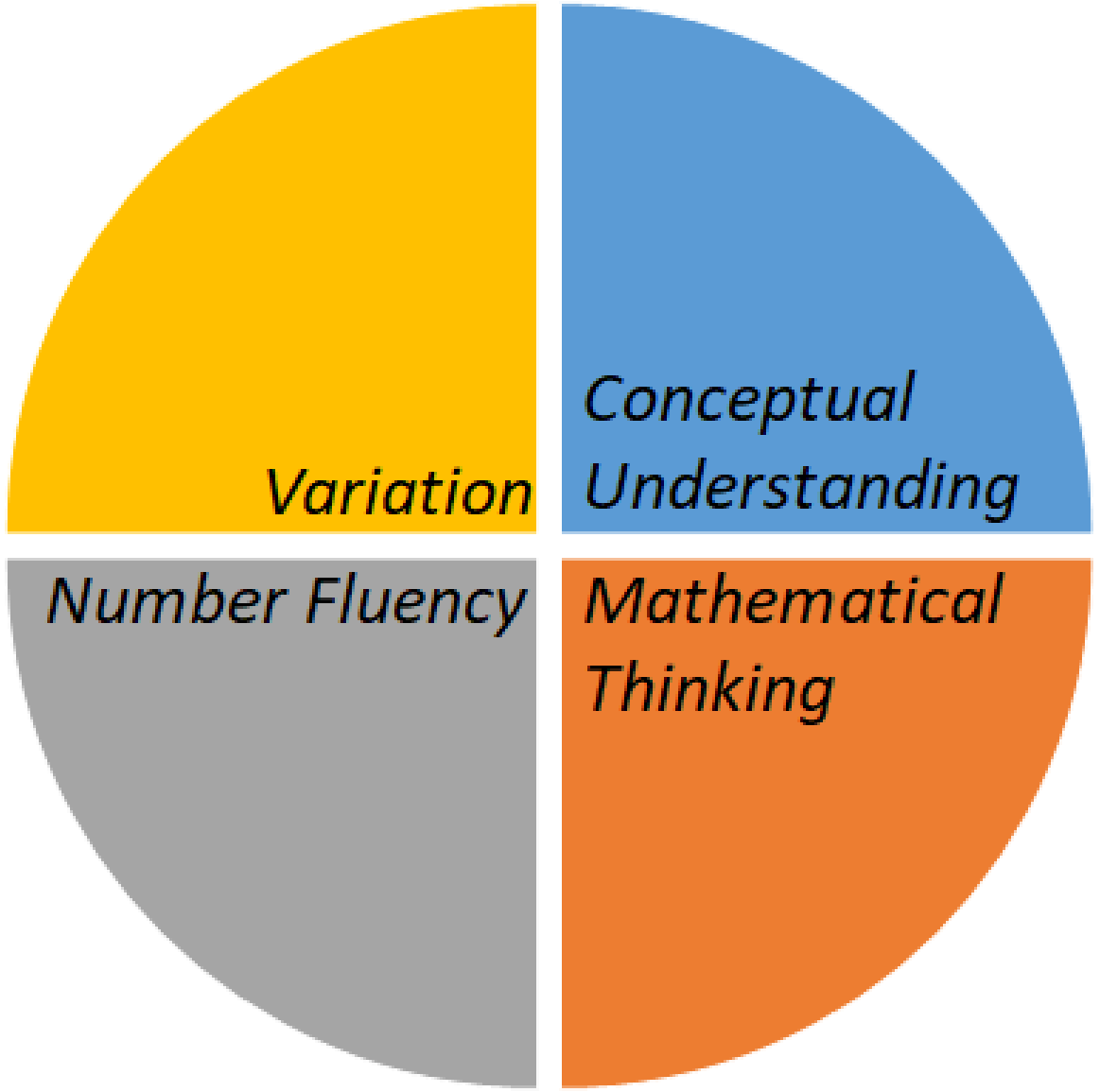
The focus is on the development of deep structural knowledge and the ability to make connections. Making connections in mathematics deepens knowledge of concepts and procedures, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques.

- NCETM 2014

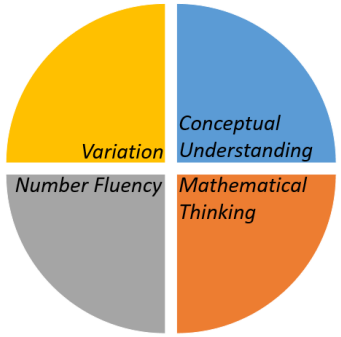
What does Mastery teaching look like?

- Whole class mixed ability teaching
- Giving **all** children the same opportunities
- Challenging children with breadth and depth of learning rather than accelerating learning
- Working with concrete and visual representations where possible to enable understanding before moving onto abstract (CPA approach)
- Giving children stem sentences (sentence frameworks) during inputs and within their task to embed understanding, skills and knowledge
- Work through maths problems which have small step changes (variation) so that children can make links and succeed
- Give **all** children the opportunity to use mathematical thinking to solve problems and also reason (most lessons!)
- Encourage children to be using high quality mathematical language with the use of stem sentences and reason through explanation
- Give children the opportunities to become fluent and efficient in mathematics, especially number and fraction
- Ensure that children are exposed to routine problems and visuals as well as non-routine
- Expose patterns and connections in maths where possible

Core Principles of our Mathematics teaching



= Quality First Teaching

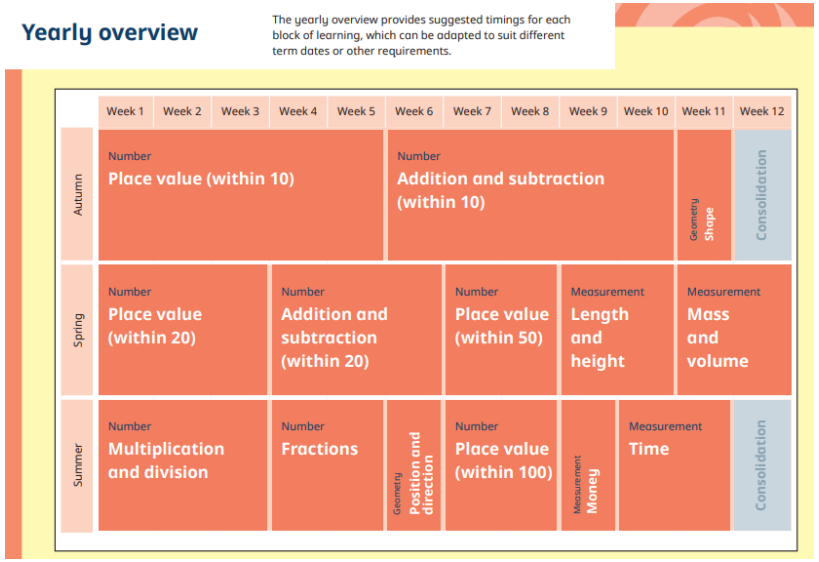


Core Principle	Evidence
Variation	*Small steps/small changes from one task to the next* *Making connections explicit* *Small changes made within procedural work, in reasoning questions and in visuals which are used* *The newer the concept or the less confident, the more variation should be used* *When children have mastered a concept, they can begin to move away from variation in practice*
Number Fluency	*Frequent retrieval of taught concepts* *Secure knowledge of facts (x tables, measure etc.)* *Stem sentences used to embed these facts* *Progression in mental and written (formal and informal) methods* *Gaps are filled* *Encourage children to use efficient methods to solve problems*
Conceptual Understanding	*Concrete and visual representations are used where they support learning* *Concrete, pictorial then abstract approach (CPA)* *Bar model, part-part wholes are used to represent structures* *Use routine and non-routine representations*
Mathematical Thinking	*Depth and breadth of learning to embed learning* *Mathematical thinking as an element of most lessons* *Different types of reasoning tasks* *Stand alone reasoning lessons*

White Rose

- White Rose are an organisation of lead Maths practitioners who have developed planning, training and resources for schools to use within Primary and Secondary Schools
- Their long and medium term plans are free along with some of their resources. We are premium subscribers, so access to resources (used for ideas)
- Longer units of work for more depth and breadth of study compared to other models such as Hampshire's –broken into smaller steps
- White Rose follows a 'Mastery' curriculum so goes hand in hand with our Maths curriculum
- We use their yearly overviews and follow the small steps progression for teaching sequence
- Use guides to support teaching knowledge and fluency within lesson

Yearly Overview



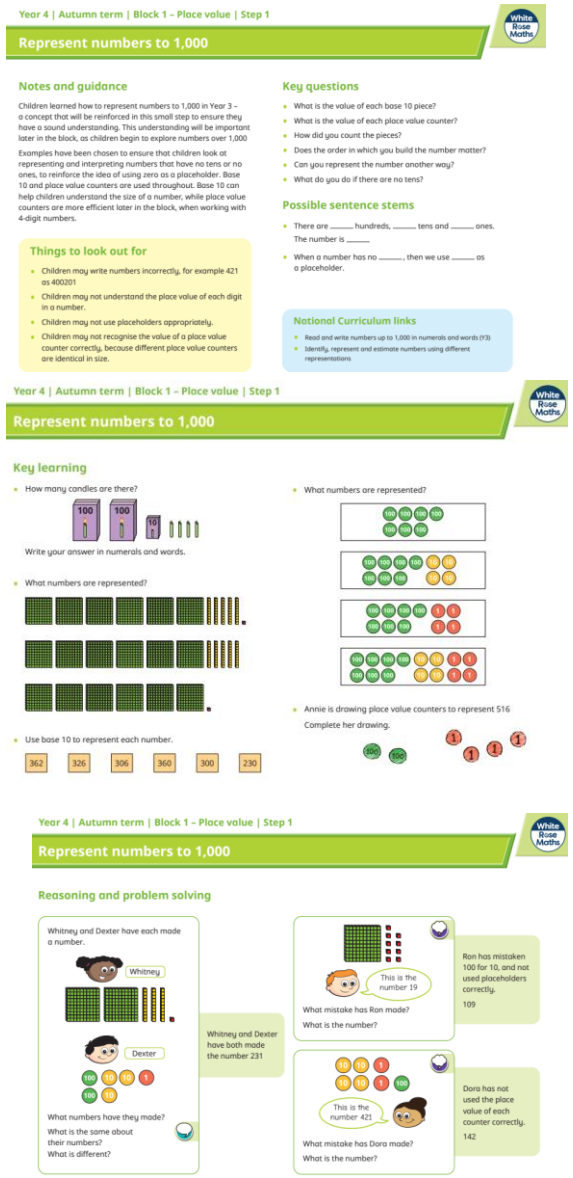
Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	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 (within 10)					Number Addition and subtraction (within 10)					Geometry Shape	Consolidation
Spring	Number Place value (within 20)		Number Addition and subtraction (within 20)			Number Place value (within 50)			Measurement Length and height		Measurement Mass and volume	
Summer	Number Multiplication and division			Number Fractions	Geometry Position and direction	Number Place value (within 100)		Measurement Money		Measurement Time		Consolidation

Schemes of Learning

Lesson Guides



Year 4 | Autumn term | Block 1 – Place value | Step 1

Represent numbers to 1,000

Notes and guidance

Children learned how to represent numbers to 1,000 in Year 3 – a concept that will be reinforced in this small step to ensure they have a sound understanding. This understanding will be important later in the block, as children begin to explore numbers over 1,000

Examples have been chosen to ensure that children look at representing and interpreting numbers that have no tens or no ones, to reinforce the idea of using zero as a placeholder. Base 10 and place value counters are used throughout. Base 10 can help children understand the size of a number, while place value counters are more efficient later in the block, when working with 4-digit numbers.

Things to look out for

- Children may write numbers incorrectly, for example 421 as 400201
- Children may not understand the place value of each digit in a number.
- Children may not use placeholders appropriately.
- Children may not recognise the value of a place value counter correctly, because different place value counters are identical in size.

Key questions

- What is the value of each base 10 piece?
- What is the value of each place value counter?
- How did you count the pieces?
- Does the order in which you build the number matter?
- Can you represent the number another way?
- What do you do if there are no tens?

Possible sentence stems

- There are _____ hundreds, _____ tens and _____ ones. The number is _____
- When a number has no _____, then we use _____ as a placeholder.

Notional Curriculum links

- Read and write numbers up to 1,000 in numerals and words (Y3)
- Identify, represent and estimate numbers using different representations

Year 4 | Autumn term | Block 1 – Place value | Step 1

Represent numbers to 1,000

Key learning

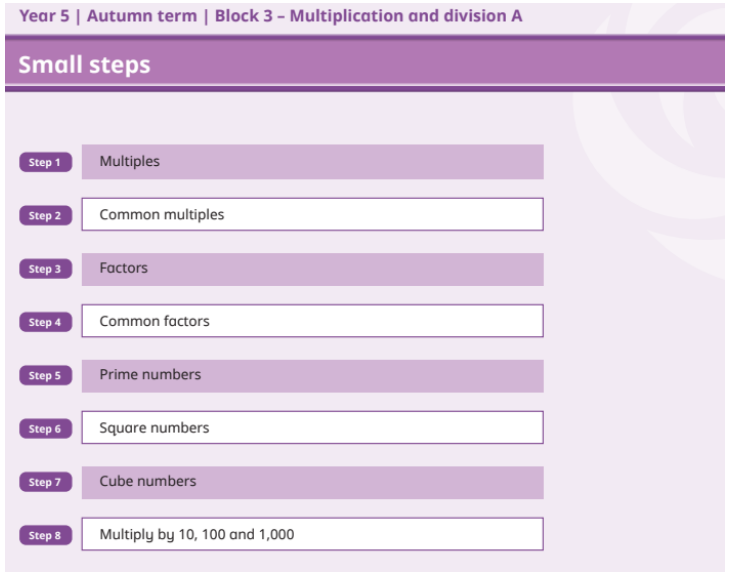
- How many candles are there?
- What numbers are represented?
- What numbers are represented?
- Use base 10 to represent each number.
- Annie is drawing place value counters to represent 516. Complete her drawing.

Year 4 | Autumn term | Block 1 – Place value | Step 1

Represent numbers to 1,000

Reasoning and problem solving

Small steps progression

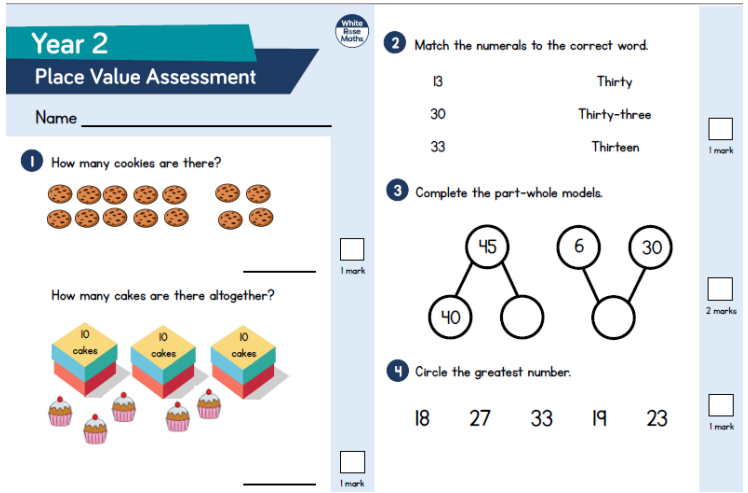


Year 5 | Autumn term | Block 3 – Multiplication and division A

Small steps

Step 1	Multiples
Step 2	Common multiples
Step 3	Factors
Step 4	Common factors
Step 5	Prime numbers
Step 6	Square numbers
Step 7	Cube numbers
Step 8	Multiply by 10, 100 and 1,000

End of Block Assessments



Year 2
Place Value Assessment

Name _____

1 How many cookies are there?

_____ 1 mark

How many cakes are there altogether?

_____ 1 mark

2 Match the numerals to the correct word.

13	Thirty
30	Thirty-three
33	Thirteen

1 mark

3 Complete the part-whole models.

45, 40 — 6, 30

2 marks

4 Circle the greatest number.

18 27 33 19 23

1 mark

Add and subtract integers

Notes and guidance

This small step reviews and extends children's learning of how to add and subtract integers with any number of digits.

Children use the formal column method for numbers with the same and different numbers of digits. They also practise mental strategies with both large and small numbers, using their understanding of place value.

Children solve multi-step problems, choosing which operations and methods to use based on the context of the problem and the types of numbers involved.

The use of concrete manipulatives can support children's understanding, especially where exchanges are required.

Things to look out for

- Children may not line the numbers up correctly when setting out an addition or a subtraction.
- Children may try to use formal methods when mental strategies would be more appropriate, for example adding 999 is more easily done by adding 1,000 and then subtracting 1
- When solving multi-step problems, children may need support to choose the type and order of operations needed.

Key questions

- What is the greatest digit you can have in a place value column?
- How do you exchange when adding?
- How do you exchange when subtracting?
- Which columns are affected by the exchange?
- How do you know whether to add or subtract the numbers?
- How can you check your answer to the calculation?

Possible sentence stems

- In column addition/subtraction, we start with the _____ place value column.
- The _____ is in the _____ column. It represents _____

National Curriculum links

- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- Solve problems involving addition, subtraction, multiplication and division
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Year 6 | Autumn term | Block 2 – Addition, subtraction, multiplication and division | Step 1

Add and subtract integers

Key learning

- Work out the additions.

623 + 358	5647 + 861	346 08 + 29 087

- Work out the subtractions.

752 − 315	816 − 539	346 08 − 12 727

- Find the answers to the calculations.

34 621 + 25 734	476 132 5 − 93 805 2

- Which calculations would you work out mentally, and which would you work out using the column method?

67,832 + 5,258	834,501 – 299,999	450,000 + 201,000
8 million subtract $3\frac{1}{2}$ million		604,000 – 25,000

Work out the answers to the calculations.

- Find the missing digits.

	5	2	2	4	7	☐
+	3	☐	5	9	0	4
	9	0	☐	3	☐	2

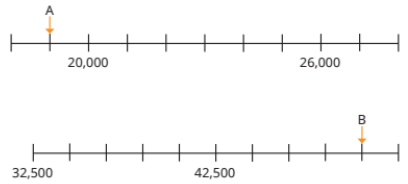
- The perimeter of the triangle is equal to the perimeter of the rectangle. Work out the unknown length of the triangle.

Year 6 | Autumn term | Block 2 – Addition, subtraction, multiplication and division | Step 1

Add and subtract integers

Reasoning and problem solving

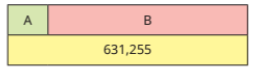
Find the difference between A and B.



Explain your method to a partner.

31,500

Here is a bar model.



- A is an odd integer that rounds to 100,000 to the nearest 10,000
- The sum of the digits of A is 30
- B is an even integer that rounds to 500,000 to the nearest 100,000
- The sum of the digits of B is 10
- A and B are both multiples of 5

What could be the values of A and B?

Explain your reasoning to a partner.

multiple possible answers, e.g.

A = 99,255

B = 532,000

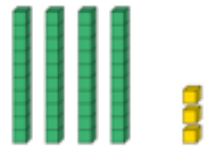
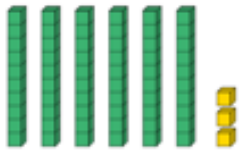
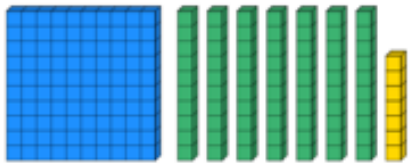
*3-page **guide** per lesson*
- notes and guidance
- key questions/ sentence stems/misconceptions
- varied fluency ideas
- reasoning and problem solving ideas

Do you all have log-ins?

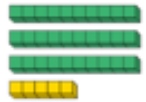
Use White Rose as a start point, then create your own lesson resources

I can understand the place value of ones, tens and hundreds

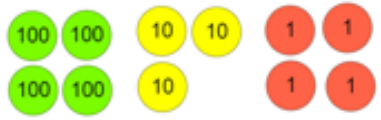
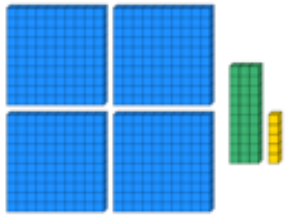
Part 1 – find out what number these visuals represent

	There are: _____ tens _____ ones Which represents the number: _____
	There are: _____ tens _____ ones Which represents the number: _____
	There are: _____ tens _____ ones Which represents the number: _____
	There are: _____ hundreds _____ tens _____ ones Which represents the number: _____
	There are: _____ hundreds _____ tens _____ ones Which represents the number: _____
	There are: _____ hundreds _____ tens _____ ones Which represents the number: _____

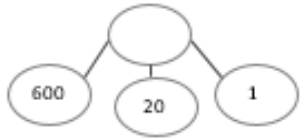
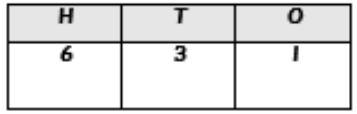
Part 2 – circle the odd one out and explain why

	**Thirty-five**
	

The value I have circled is the odd one out because it represents _____ whereas the other boxes represent the number _____

	
400 + 30 + 4	**Four hundred and thirty four**

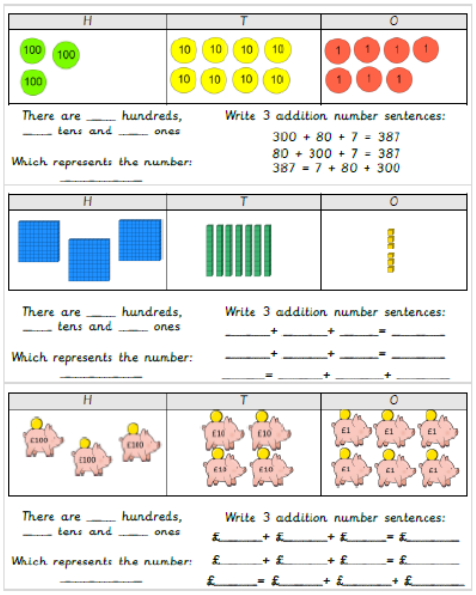
The value I have circled is the odd one out because it represents _____ whereas the other boxes represent the number _____

Six ***hundreds*** *Three* ***tens*** *Two* ***ones***	
	

H	T	O
6	3	1

The value I have circled is the odd one out because it represents _____ whereas the other boxes represent the number _____

Variation



I can expand 3-digit numbers and use this to solve addition and subtraction problems mentally.

Part 1 – Work out how many hundreds, tens and ones there are and then write the corresponding addition sentences.

H	T	O
100 100 100	10 10 10 10 10 10 10 10	1 1 1 1 1 1 1

There are ____ hundreds, ____ tens and ____ ones

Which represents the number: _____

Write 3 addition number sentences:

300 + 80 + 7 = 387
80 + 300 + 7 = 387
387 = 7 + 80 + 300

H	T	O

There are ____ hundreds, ____ tens and ____ ones

Which represents the number: _____

Write 3 addition number sentences:

_____ + _____ + _____ = _____
_____ + _____ + _____ = _____
_____ = _____ + _____ + _____

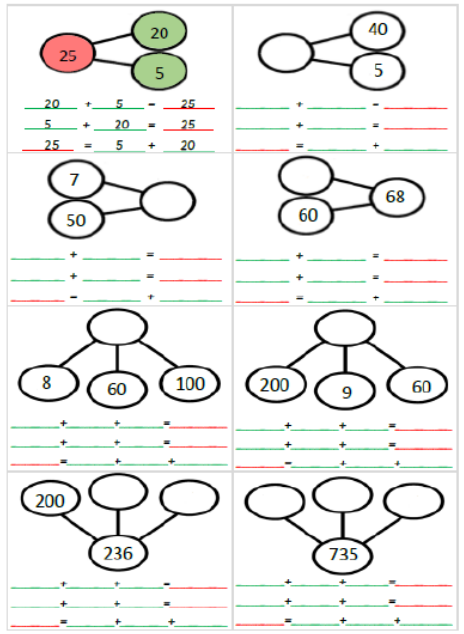
H	T	O
£100 £100 £100	£10 £10 £10 £10 £10 £10	£1 £1 £1 £1 £1 £1 £1

There are ____ hundreds, ____ tens and ____ ones

Which represents the number: _____

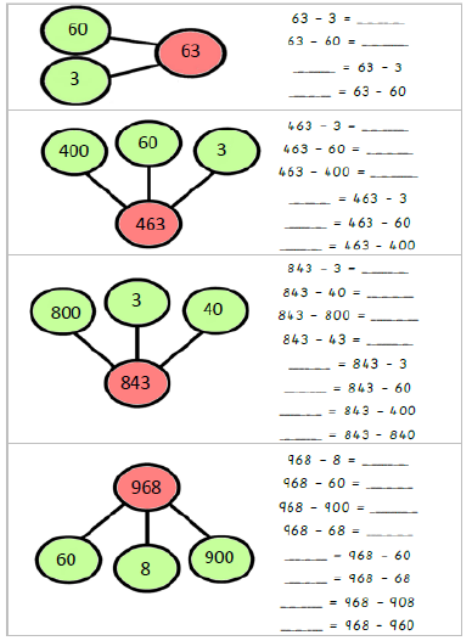
Write 3 addition number sentences:

£_____ + £_____ + £_____ = £_____
£_____ + £_____ + £_____ = £_____
£_____ = £_____ + £_____ + £_____



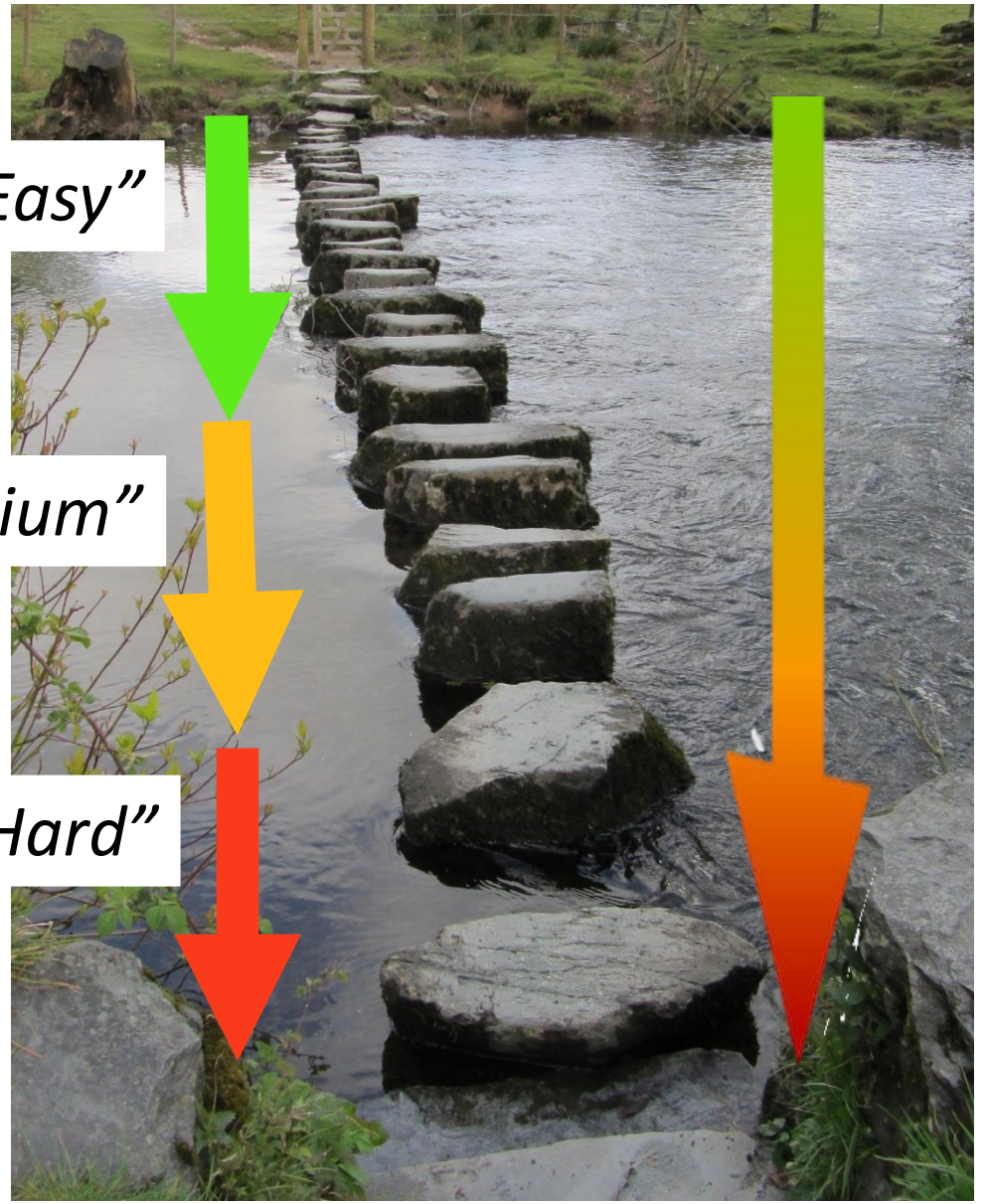
Part 2 – Colour in the 'whole' red and the 'parts' green. Find the missing values in the part-part wholes then write the addition number sentences.

Part 3 – Use the part-part whole to help you find the answer to the subtraction question using mental skills.



Part 4 – Solve the blank values in each set.

50 + 4 = _____	20 + 9 = _____
50 + _____ = 54	20 + _____ = 29
4 + _____ = 54	9 + _____ = 29
54 - _____ = 54	29 - _____ = 20
54 - _____ = 54	29 - _____ = 9
200 + 90 = _____	200 + 9 = _____
200 + _____ = 290	200 + _____ = 209
90 + _____ = 290	90 + _____ = 209
290 - _____ = 200	209 - _____ = 200
290 - _____ = 90	209 - _____ = 209
200 + 90 + 3 = _____	400 + 90 + 5 = _____
200 + 90 + _____ = 293	400 + 90 + _____ = 495
200 + 3 + _____ = 293	400 + 5 + _____ = 495
90 + _____ + 3 = 293	90 + _____ + 5 = 495
293 - _____ = 290	495 - _____ = 490
293 - _____ = 200	495 - _____ = 400
293 - _____ = 203	495 - _____ = 405
293 - _____ = 3	495 - _____ = 5
293 - _____ = 290	495 - _____ = 490
293 - _____ = 93	495 - _____ = 95
635 - _____ = 630	737 - _____ = 730
635 - _____ = 600	737 - _____ = 700
635 - _____ = 605	737 - _____ = 707
635 - _____ = 5	737 - _____ = 7
635 - _____ = 35	737 - _____ = 37

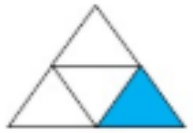


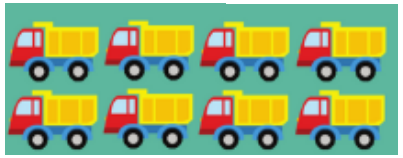
Variation: supports fluency

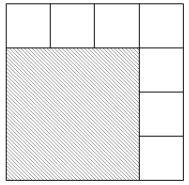
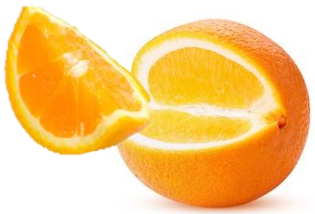
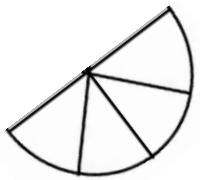
Conceptual Variation

Conceptual variation *means the opportunity to work on different representations of the same mathematical idea; include routine and non-routine*







Procedural Variation

Procedural variation *means a set of numerical questions where there are small changes/ links between each question*

10, 20, 30, 40, ___, ____, ____
11, 21, 31, 41, ___, ____, ____
12, 22, 32, 42, ___, ____, ____

____ = 10 + 9
____ = 11 + 9
____ = 12 + 9
____ = 13 + 9
____ = 14 + 9
____ = 15 + 9

132 x 7 =
132 x 8 =
133 x 8 =
143 x 8 =
145 x 9 =
265 x 9 =

1/3 ÷ 2 = 1/3 ÷ 3 = 1/3 ÷ 4 =
1/3 ÷ 5 = 1/3 ÷ 6 = 1/3 ÷ 2 =

Mathematical Thinking Variation

Mathematical Thinking variation *means small changes to reasoning problems through numbers, complexity or context*

Nikki cycles 1200m.
Charles cycles 1 ½ km.
Charles says "I've cycled the furthest."
Is he correct? Explain your answer:

Rachel cycles 1200m.
Miri cycles 1 ½ km.
Rachel says "I've cycled the furthest."
Is she correct? Explain your answer:

Emma swims 1450m.
Sharon swims 1 ½ km.
Donna says "They both swam the same distance"
Is she correct? Explain your answer:

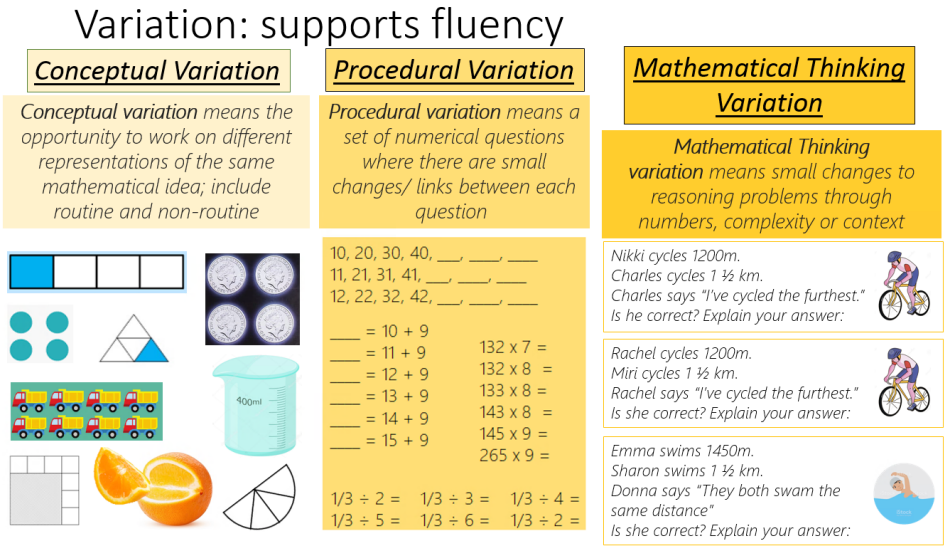
Consider what level of variation is suitable for the concept, and for your class.

___ = 10 + 9	___ = 10 + 9	___ = 10 + 9	___ = 10 + 9	___ = 10 + 9
___ = 11 + 9	___ = 11 + 9	___ = 11 + 9	___ = 12 + 5	___ = 12 - 5
___ = 12 + 9	___ = 12 + 9	___ = 15 + 9	___ = 10 + 4	___ = 10 + 4
___ = 13 + 9	___ = 13 + 9	___ = 26 + 9	___ = 18 + 2	___ = 18 ÷ 2
___ = 14 + 9	___ = 23 + 9	___ = 54 + 9	___ = 3 + 17	___ = 3 x 4
___ = 15 + 9	___ = 24 + 9	___ = 17 + 9	___ = 13 + 9	___ = 13 + 9
___ = 16 + 9	___ = 34 + 9	___ = 58 + 9	___ = 27 + 9	___ = 20 + 7
___ = 17 + 9	___ = 44 + 9	___ = 79 + 9	___ = 9 + 19	___ = 38 - 10
___ = 18 + 9	___ = 47 + 9	___ = 34 + 9	___ = 18 + 5	___ = 5 x 10
___ = 19 + 9	___ = 49 + 9	___ = 15 + 9	___ = 34 + 9	___ = 4 + 5 + 9

Variation → Variety

Have a go…

- Find your next unit/lesson on White Rose
- What is the learning?
- What would the fluency practice for the lesson look like?
- How could you use variation to support the learning?



Stem Sentences

Stem sentences are an oral or written framework which is repeated. It helps children to identify patterns and remember key facts.

1 thousand is equal to 1000

2 thousands are equal to 2000

3 thousands are equal to 3000

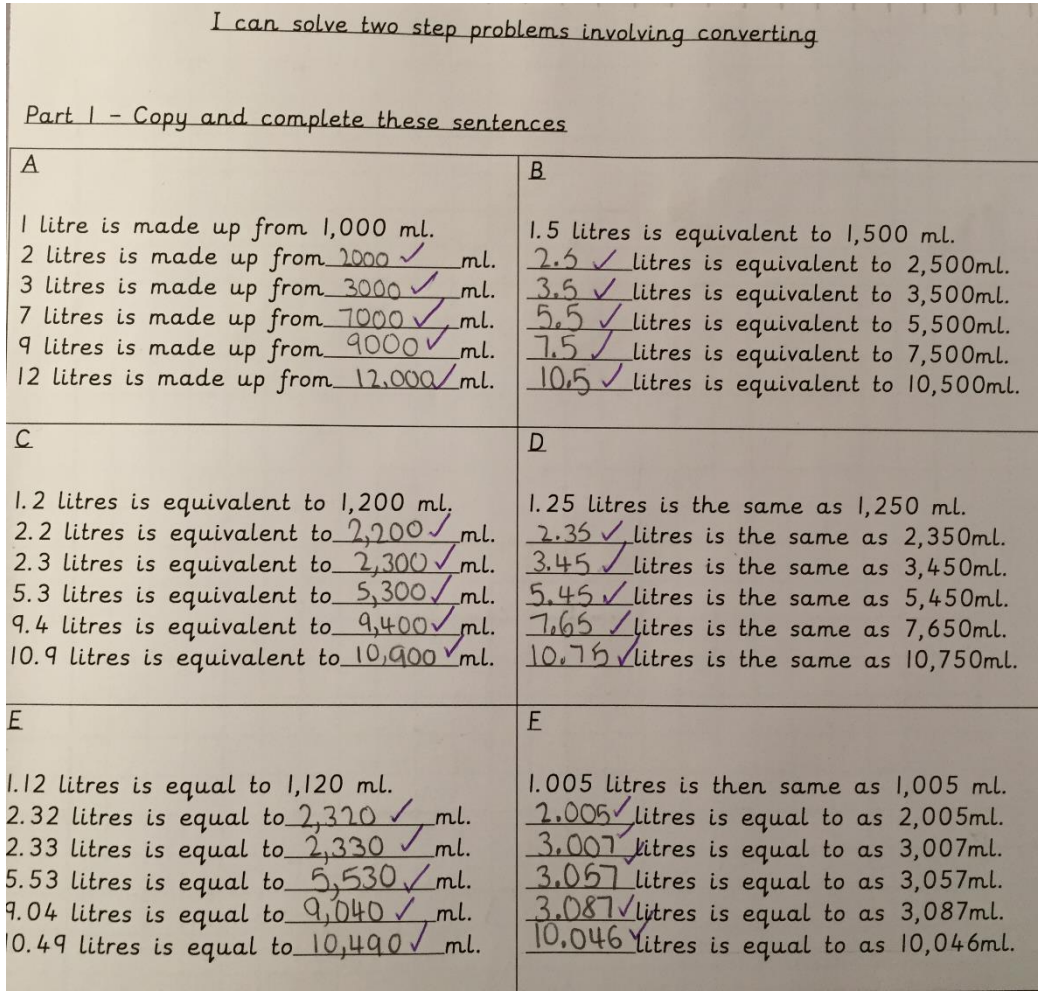
4 thousands are equal to ___

5 thousands are equal to ___

__thousands are equal to ___

__thousands are equal to ___

__thousands are equal to ___



I can solve two step problems involving converting

Part 1 - Copy and complete these sentences

A

1 litre is made up from 1,000 ml.
2 litres is made up from 2000 ml.
3 litres is made up from 3000 ml.
7 litres is made up from 7000 ml.
9 litres is made up from 9000 ml.
12 litres is made up from 12,000 ml.

B

1.5 litres is equivalent to 1,500 ml.
2.5 litres is equivalent to 2,500ml.
3.5 litres is equivalent to 3,500ml.
5.5 litres is equivalent to 5,500ml.
7.5 litres is equivalent to 7,500ml.
10.5 litres is equivalent to 10,500ml.

C

1.2 litres is equivalent to 1,200 ml.
2.2 litres is equivalent to 2,200 ml.
2.3 litres is equivalent to 2,300 ml.
5.3 litres is equivalent to 5,300 ml.
9.4 litres is equivalent to 9,400 ml.
10.9 litres is equivalent to 10,900 ml.

D

1.25 litres is the same as 1,250 ml.
2.35 litres is the same as 2,350ml.
3.45 litres is the same as 3,450ml.
5.45 litres is the same as 5,450ml.
7.65 litres is the same as 7,650ml.
10.75 litres is the same as 10,750ml.

E

1.12 litres is equal to 1,120 ml.
2.32 litres is equal to 2,320 ml.
2.33 litres is equal to 2,330 ml.
5.53 litres is equal to 5,530 ml.
9.04 litres is equal to 9,040 ml.
10.49 litres is equal to 10,490 ml.

F

1.005 litres is then same as 1,005 ml.
2.005 litres is equal to as 2,005ml.
3.007 litres is equal to as 3,007ml.
3.057 litres is equal to as 3,057ml.
3.087 litres is equal to as 3,087ml.
10.046 litres is equal to as 10,046ml.

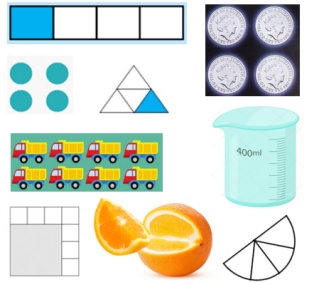
Have a go…

- Find your next unit/lesson on White Rose
- What is the learning?
- What stem sentences would support the learning?
- Examples are on the White Rose planning.
- Can you use variation and fluency to support?

Variation: supports fluency

Conceptual Variation

Conceptual variation means the opportunity to work on different representations of the same mathematical idea; include routine and non-routine



Procedural Variation

Procedural variation means a set of numerical questions where there are small changes/ links between each question

10, 20, 30, 40, ___, ___, ___
11, 21, 31, 41, ___, ___, ___
12, 22, 32, 42, ___, ___, ___

___ = 10 + 9
___ = 11 + 9
___ = 12 + 9
___ = 13 + 9
___ = 14 + 9
___ = 15 + 9

132 x 7 =
132 x 8 =
133 x 8 =
143 x 8 =
145 x 9 =
265 x 9 =

1/3 ÷ 2 = 1/3 ÷ 3 = 1/3 ÷ 4 =
1/3 ÷ 5 = 1/3 ÷ 6 = 1/3 ÷ 2 =

Mathematical Thinking Variation

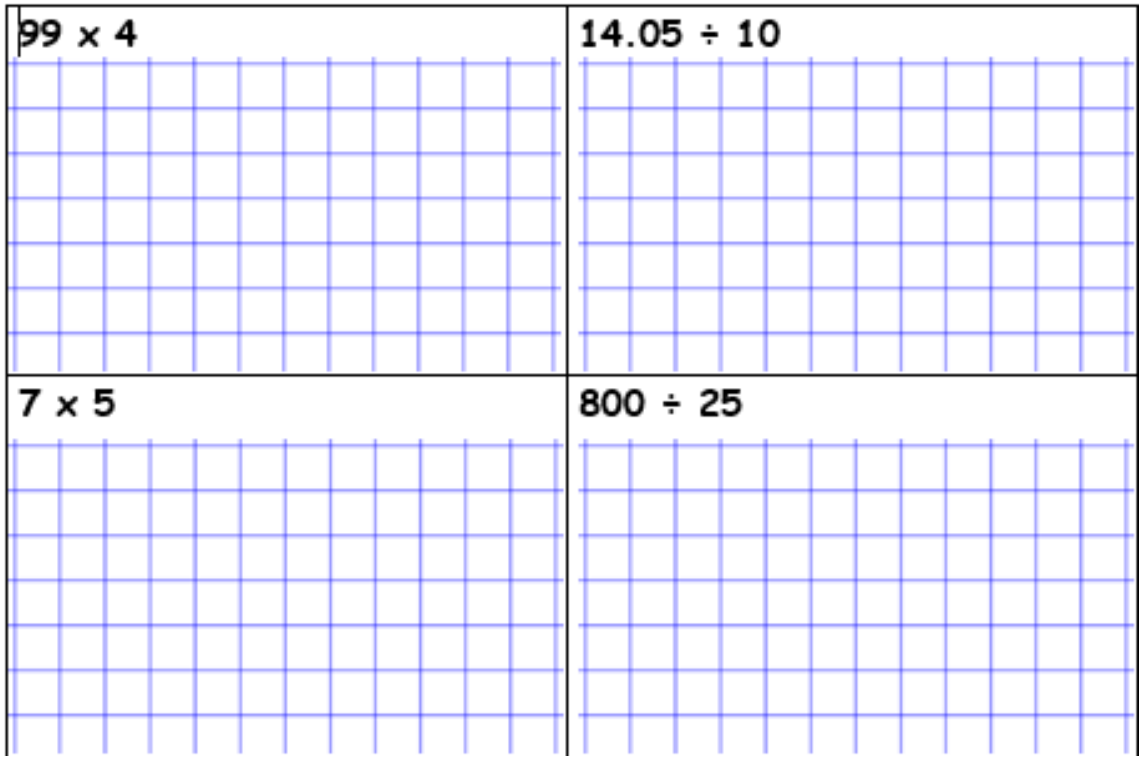
Mathematical Thinking variation means small changes to reasoning problems through numbers, complexity or context

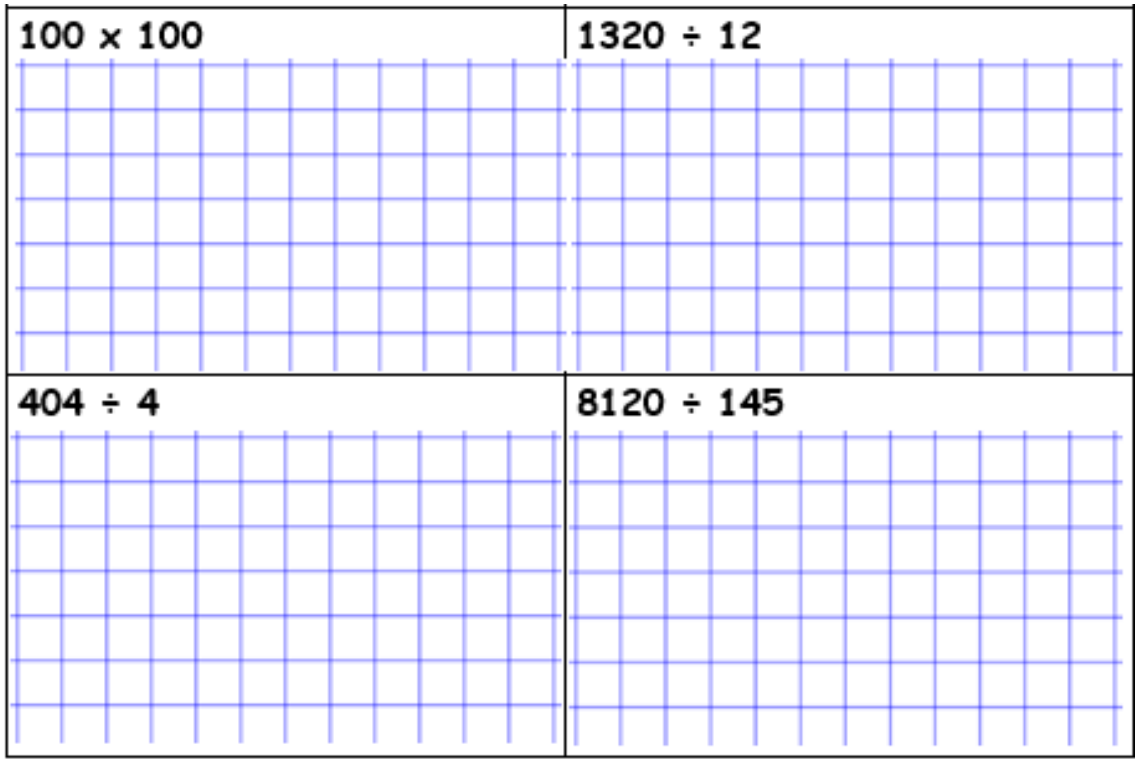
Nikki cycles 1200m.
Charles cycles 1 ½ km.
Charles says "I've cycled the furthest."
Is he correct? Explain your answer:

Rachel cycles 1200m.
Miri cycles 1 ½ km.
Rachel says "I've cycled the furthest."
Is she correct? Explain your answer:

Emma swims 1450m.
Sharon swims 1 ½ km.
Donna says "They both swam the same distance"
Is she correct? Explain your answer:

Number Fluency
‘Flashback Maths’





When solving number problems, we need to equip our children with the ability to choose efficient methods drawing on their knowledge.

Alongside more formal methods, we teach children a range of mental maths skills and how to use jottings to support their thinking.

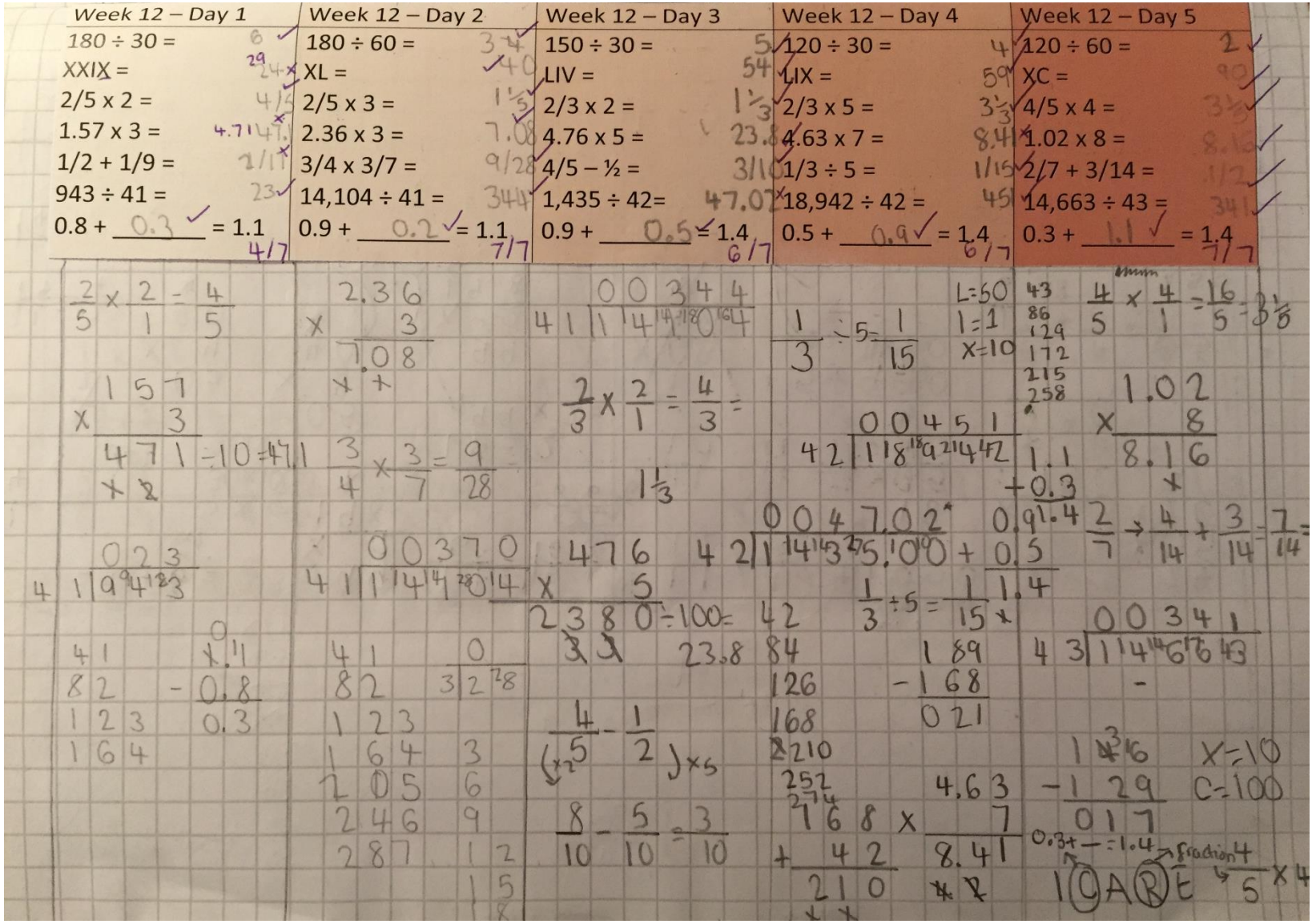
Number Fluency 'Flashback Maths'?

5 x 8 =	8 x 12 =	6 x 8 =	7 x 6 =	4 x 12 =
0.1, 0.2, 0.3, ____, ____	0.4, 0.5, 0.6,____, ____	0.7, 0.8, 0.9,____, ____	1.1, 1.2, 1.3, ____, ____	1.7, 1.8, 1.9, ____, ____
465 + _____ = 2012	567 + _____ = 3204	_____ + 723 = 3205	_____ + 766 = 6005	867 + _____ = 2014
½ of 244 =	Half of 324 =	½ of 452 =	Half of 532 =	½ of 954 =
4.9 – 1.23 =	6.8 – 2.45 =	5.7 – 2.34 =	6.5 – 4.56 =	9.4 – 2.64
560 ÷ 10 =	565 ÷ 10 =	574 ÷ 10 =	634 ÷ 10 =	751 ÷ 10 =

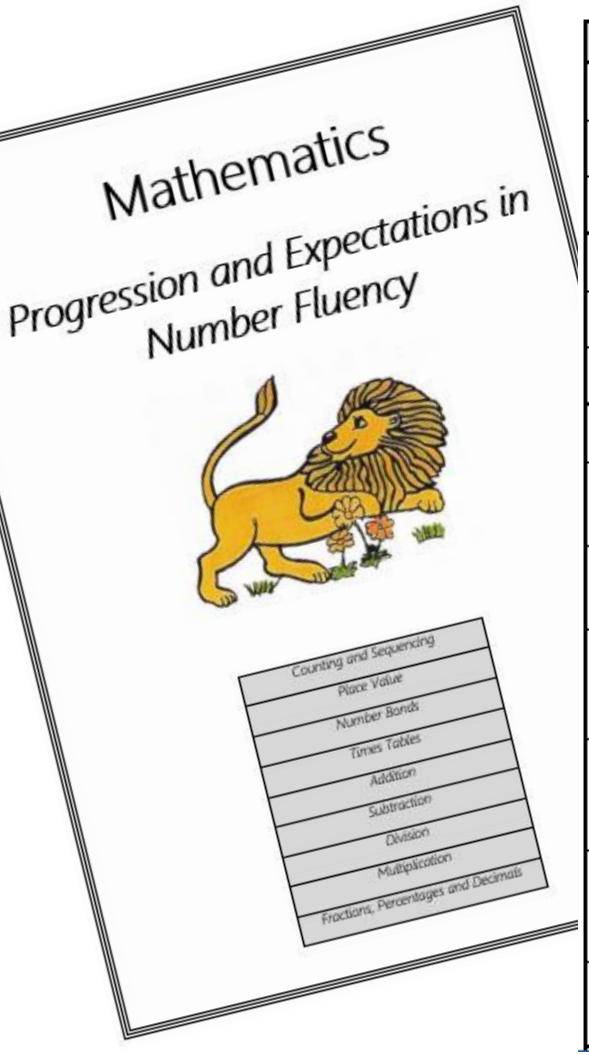
- Completed at the start of Maths lessons or after registration (once children are settled back in)
- Number and Fraction focus (similar to the Arithmetic test!)
- Focus on mental recall, jottings, visuals and formal methods
- Children will have a time limit to complete the questions and use the remaining time to check answers
- A set of questions with particular themes
- Only taught concepts but from any year group objective
- Keep learning alive!
- Use variation according to security
- Self checking when appropriate to the year group (**I**nverse **C**heck over **A**nother method **R**edo **E**stimate)
- Choose a teacher to plan this for a half term or so, so that they can keep track of what skills have been covered

Flashback Maths Yr 6 Example

- Get into the routine at the start of Maths lessons
- Encourage and praise working out!
- Adults to support children working below
- Give a time limit appropriate to their age (usually 5 mins)
- Children to self mark
- Model efficient and alternative methods when marking
- Errors can be addressed whole class or through pupil/group intervention



Where to get your question ideas from…



Addition	
Add three 1-digit numbers 5 + 7 + 3 = _____ = 7 + 8 + 3	KS1 – Addition, use of symbols, varied sentence structures
Add three numbers within 100 15 + 7 + 3 = _____ = 7 + 18 + 3	KS1 – Addition, use of symbols, varied sentence structures
Add two numbers which bridge the 100s 94 + 4 = ____ = 94 + 4	KS1 – Addition, use of symbols, varied sentence structures
Add multiples of 10 to a 2-digit number 23 + 20 = _____ = 56 + 40	KS1 – Place value, addition, use of symbols, varied sentence structures
Add multiples of 10 to a 3-digit number 222 + 70 =_____ _____ = 359 + 60	Year 3 – Place value, Addition
Add multiples of 100 to a 3-digit number 222 + 700 =_____ _____ = 359 + 600	Year 3 – Place value, Addition
Add a 1-digit and a 2-digit number 22 + 7 = _____ = 35 + 6	KS1 – Place value, addition, use of symbols, varied sentence structures
Add two 2-digit numbers 23 + 54 = _____ = 36 + 25 12 + _____ = 37 24 + 37 =	KS1 – Addition, use of symbols, varied sentence structures
Add 1-digit and a 3-digit number 3 + 134 = _____ = 7 + 291 222 + 7 = _____ = 359 + 6	Year 3 – Addition, use of symbols, varied sentence structures
Add numbers with up to 3 digits, using formal written methods of columnar addition 568 + 53 = 723 + 537 = _____ = 625 + 271 _____ + 625 = 823	Year 3 – Addition, use of symbols, varied sentence structures
Add numbers with up to 4 digits, using formal written methods of columnar addition 6541 + 23 = 6721 + 432 = 1347 + 4356 = _____ = 4357 + 4677	Year 4 – Addition, use of symbols, varied sentence structures
Add numbers with more than 4 digits, using formal written methods of columnar addition 62,541 + 5,123 = 67,021 + 8,432 = 1,347 + 403,256 = _____ = 457 + 46,577	Year 5 – Addition, use of symbols, varied sentence structures
Solve addition problems with numbers up to 10,000,000 602,541 + 57,123 = _____ + 811,432 = 1,354,679 1,508,347 + 403,256 = _____ = 40,557 + 987,577	Year 6 – Addition, use of symbols, varied sentence structures

Number Bonds	
Use number bonds and related facts within 10 5 + ___ = 7 ____ + 4 = 7 8 = 6 + ____ 6 – 3 = ___ 9 - ____ = 7 1 = 4 - ____	KS1 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use number bonds and related facts to 10 5 + ___ = 10 ____ + 4 = 10 10 = 6 + ____ 10 – 3 = ___ 10 - ____ = 7 9 = 10 - ____	KS1 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use number bonds and related facts within 20 5 + ___ = 12 ____ + 4 = 13 11 = 6 + ____ 16 – 8 = ___ 16 - ____ = 7 15 = 16 - ____	KS1 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use number bonds and related facts to 20 5 + ___ = 20 ____ + 14 = 20 20 = 6 + ____ 20 – 3 = ___ 20 - ____ = 7 9 = 20 - ____	KS1 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use and derive related facts to 100 40 + ___ = 100 100 = 30 + ____ 100 – 80 = _____ 100 - _____ = 70	KS1 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use number bonds to 100 42 + ___ = 100 100 = 37 + ____ 100 – 82 = _____ 100 - _____ = 56	KS1 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use number bonds to 1000 400 + ___ = 1000 1000 = 800 + ____ 1000 – 800 = _____ 1000 - _____ = 200	Year 3 – Number bonds, place value, addition, subtraction, use of symbols, varied sentence structures
Use fraction number bonds to 1 with the same denominator ½ + □/2 = 1 1/3 + □/3 = 1 2/7 + □/7 = 1	Year 4 – Number bonds, fractions, Place value, addition
Use decimal number bonds to 1 0.3 + ___ = 1 0.8 + ____ = 1 1 – 0.9 = _____ 1 - _____ = 0.5	Year 4 – Number bonds, decimals, Place value, addition, subtraction
Use decimal number bonds to 1 0.11 + ___ = 1 0.45 + ____ = 1 1 - _____ = 0.08	Year 5 – Number bonds, place value, use of symbols, varied sentence structures, addition, subtraction
Use decimal number bonds to any whole number 2.25 + ___ = 7 0.45 + ____ = 6 8 - _____ = 4.23	Year 6 – Number bonds, place value, use of symbols, varied sentence structures, addition, subtraction