Amble Links Primary School Calculation Policy

Maths at Amble Links Primary School

The aim of this document is to outline some of the key ideas relating to number development we use at Amble Links and the progressions of skills across the four operations. These range from the early counting skills and drawings in Early Years and Key Stage 1 to the more formal calculations used by the older children in Key Stage 2.

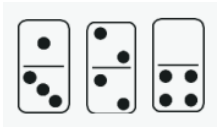
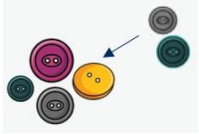
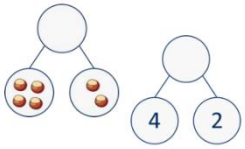
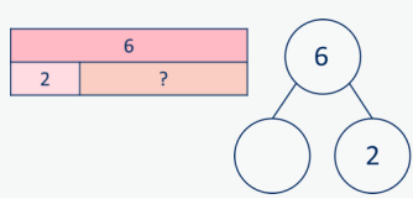
This calculation policy follows a concrete, pictorial and abstract approach, which we use in our lessons. Where appropriate, sentence stems are included alongside key representations to support children's reasoning skills.

It is important that children understand the number system through counting and place value. We explore this through sequencing, looking at patterns of numbers and how we are able to partition numbers. Written calculations are important but the children will also develop mental calculations where appropriate. The use of resources, drawings or diagrams may be needed to support this.

Times tables are key to many areas of mathematics and if children are able to recall their tables quickly, this will help them to grasp other concepts. To support children in learning and then being able to recall their times tables fluently, we have split the different times tables over the following year groups:

- Year 2 – Counting in 2s, 5s and 10s and moving onto the 2, 5 and 10 times tables, including division facts.
- Year 3 – Revision of 2, 5, 10 times tables and 3, 6, 4 and 8 times tables, including division facts.
- Year 4 – 7, 9, 11 and 12 times tables, including division facts,
- Upper Key Stage will continue to consolidate all multiplication and division facts.

Addition

Year Group	Skill	Key Representations
Early Years	• Subitise to 5 • 1 more • Notice the composition of numbers within 10 • Combine 2 groups • Add more	What do you see? How do you see it?  How many ways can you make …?  How many altogether?   There are … There are … There are … altogether. I have … I add … more. Now I have …. 
Year 1	• Add together (aggregation) • Add more (augmentation) • Bonds within 10 • Related facts within 20 • Missing numbers	… is a part. … is a part. … is the whole.  First … Then … Now …  If … is the whole and … is a part, the other part must be …. 

<table>
<tr>
<td>Year 2</td>
<td>

Add 1s to any number (related facts)
Add three 1-digit numbers
Add across 10
Add multiples of 10
Add 10s to any number
Add two 2-digit numbers
Missing numbers

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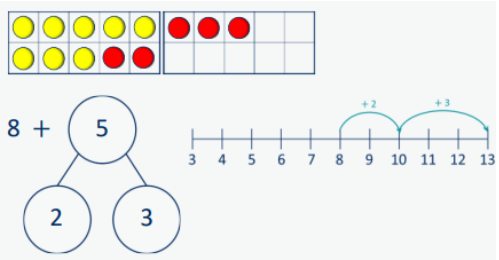
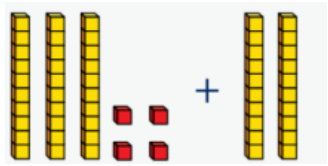
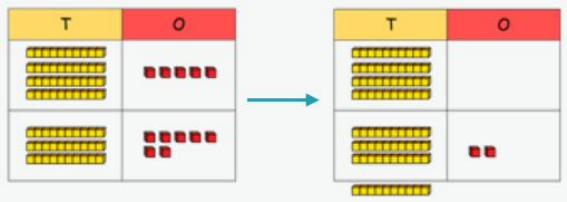
<td>
… can be partitioned into … and …


… tens + … tens = … tens
… tens and … ones = …

There are … ones so I do/do not need to exchange.
… ones = … tens and … ones
… tens + … ones = …


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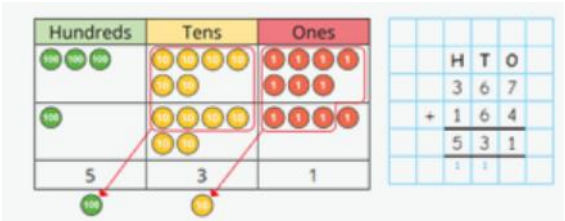
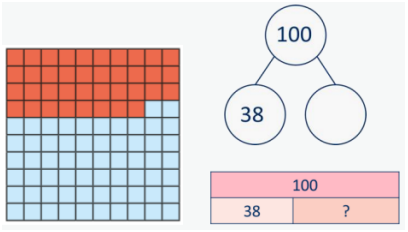
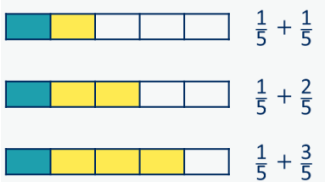
</tr>
<tr>
<td>Year 3</td>
<td>

Add 1s, 10s and 100 to a 3-digit number
Add two numbers (no exchange)
Add across a 10 or 100
Compliments to 100
Add fractions with the same denominator within 1 whole
Calculate the duration of events

</td>
<td>
There are … ones, so I do/do not need to exchange.
There are … tens, so I do/do not need to exchange.
… ones = …ten and … ones
… tens = … hundred and … tens


… plus … is equal to …


… fifths + … fifths = … fifths


</td>
</tr>
</table>

<table>
<tr>
<td>Year 4</td>
<td>

Add 1s, 10s and 100s to a 4-digit number
Add up to 4-digit numbers
Add decimal numbers in the context of money
Add fractions and mixed numbers with the same denominator beyond 1 whole

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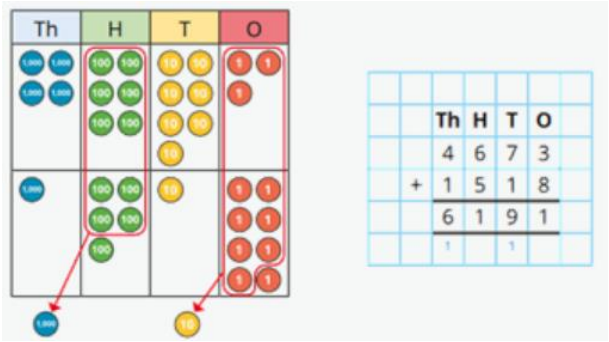
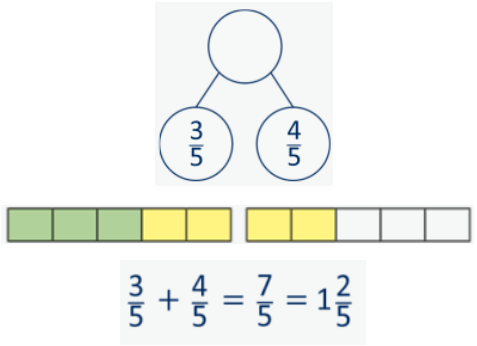
<td>
There are … ones/tens/hundreds so I do/do not need to exchange.
I can exchange 10 … for 1 ….


… fifths + … fifths = … fifths


</td>
</tr>
<tr>
<td>Year 5</td>
<td>

Add using mental strategies
Add whole numbers with more than 4 digits
Add decimals with up to 3 decimal places
Order of operations
Negative numbers
Add fractions

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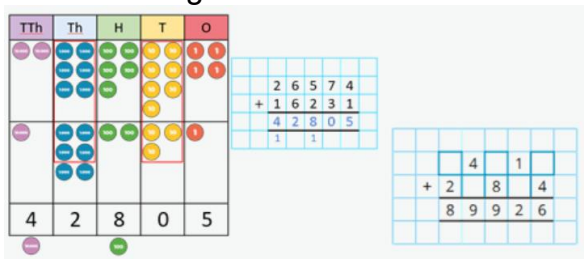
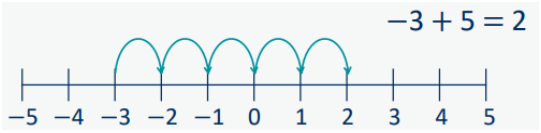
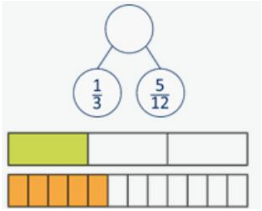
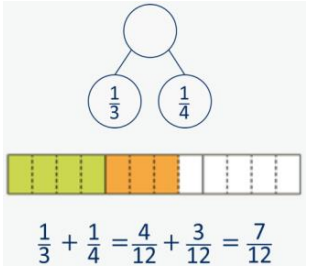
<td>
I can exchange 10… for 1 …


Decimals:


… plus … is equal to …


The denominator has been multiplied by …, so the numerator needs to be multiplied by …


The lowest common multiple of … and … is ….


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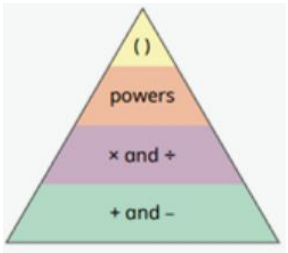
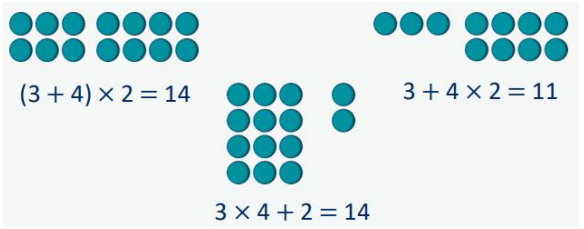
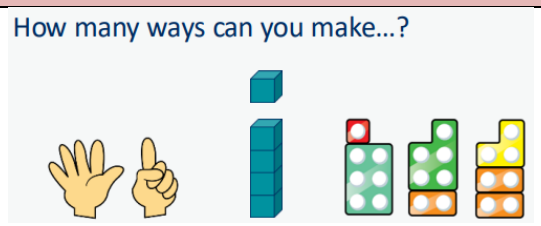
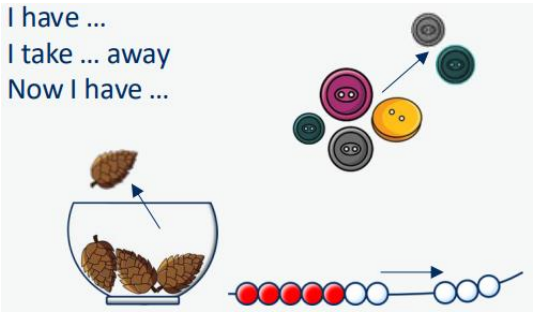
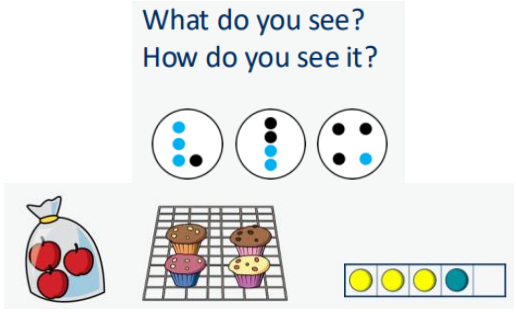
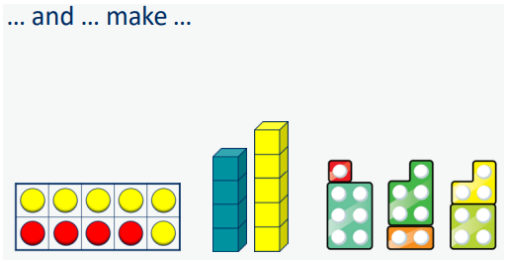
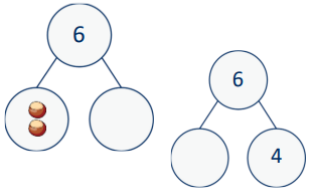
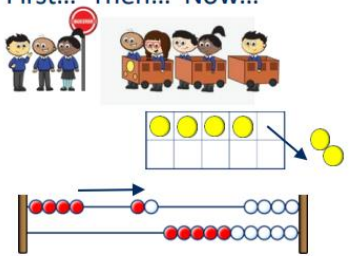
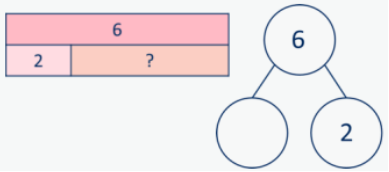
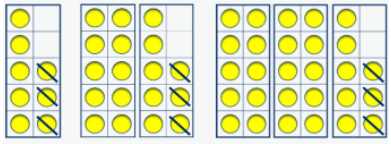
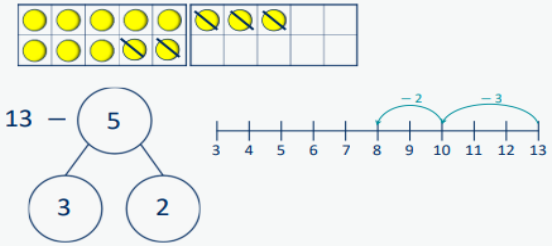
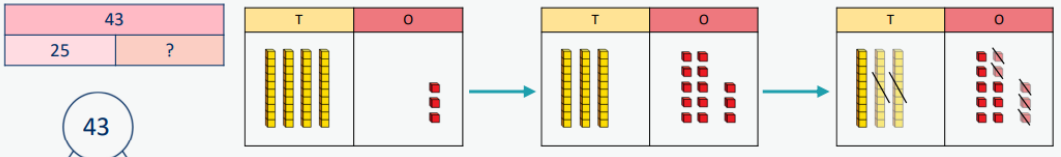
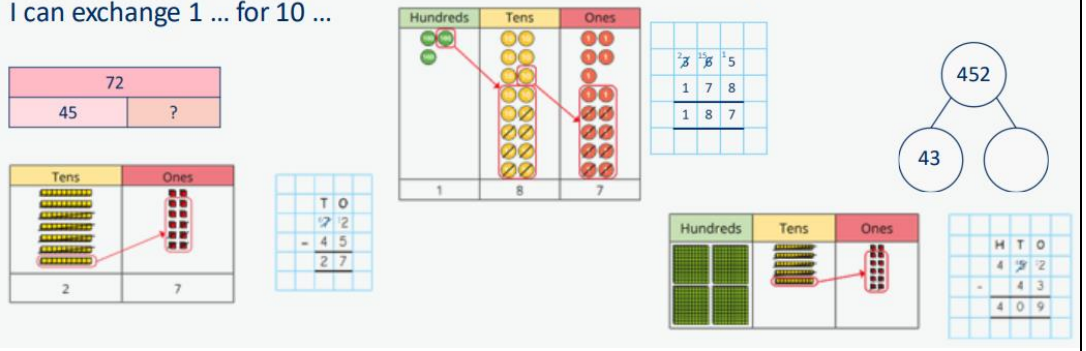
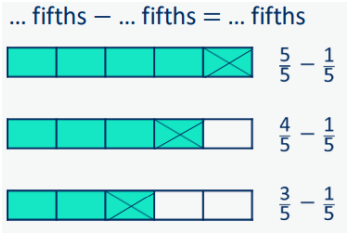
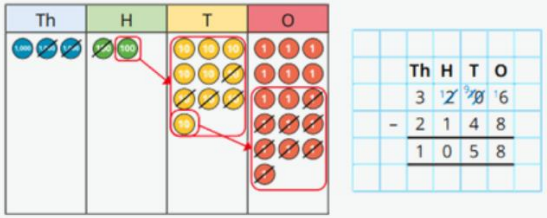
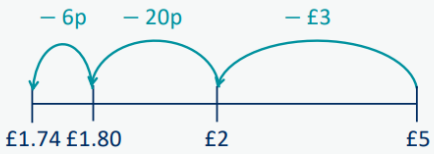
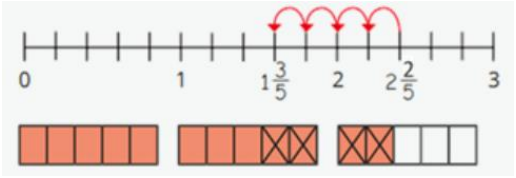
</table>

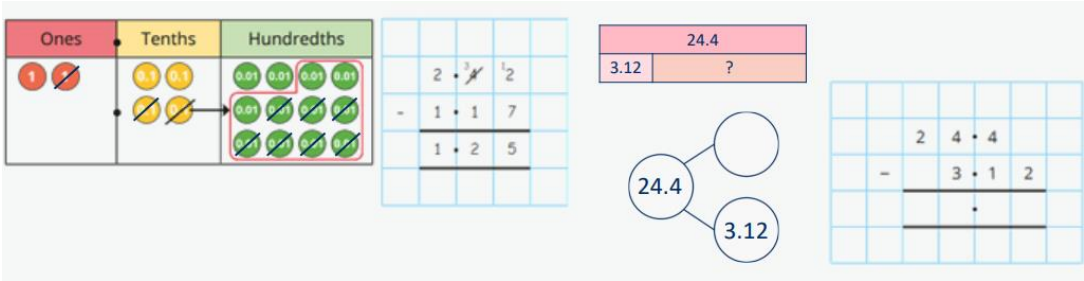
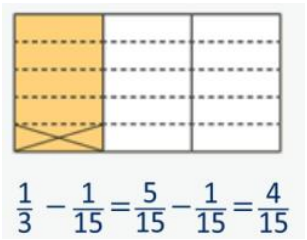
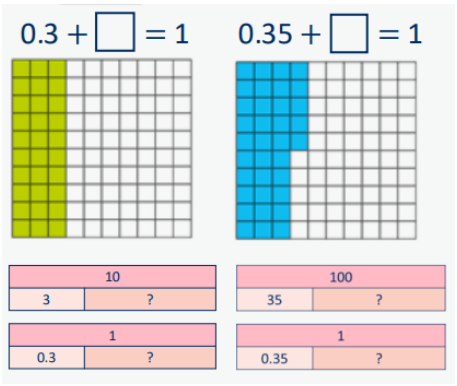
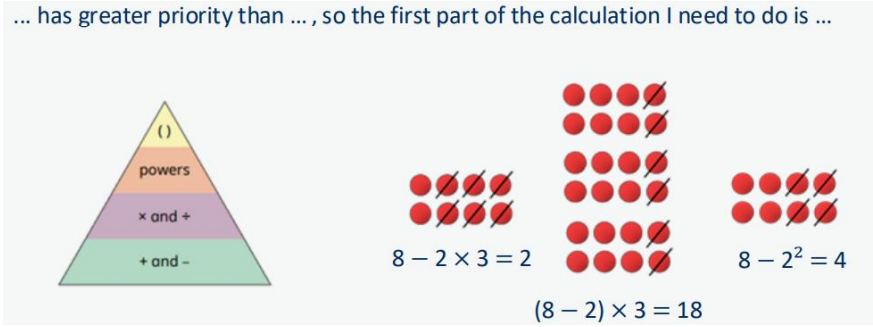
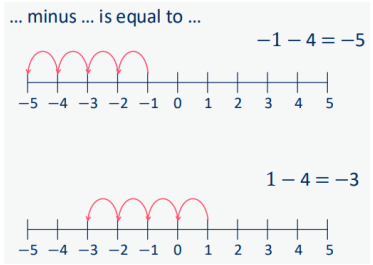
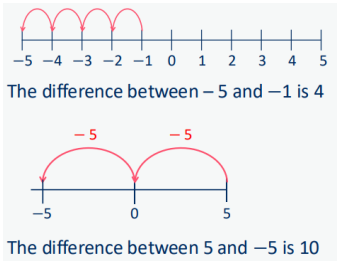
Year 6	• Add integers up to 10 million • Add decimals with up to 3 decimals places • Orders of operations • Negative numbers • Add fractions	**No new methods taught** … has greater priority than…, so the first part of the calculation I need to do is …  

Subtraction

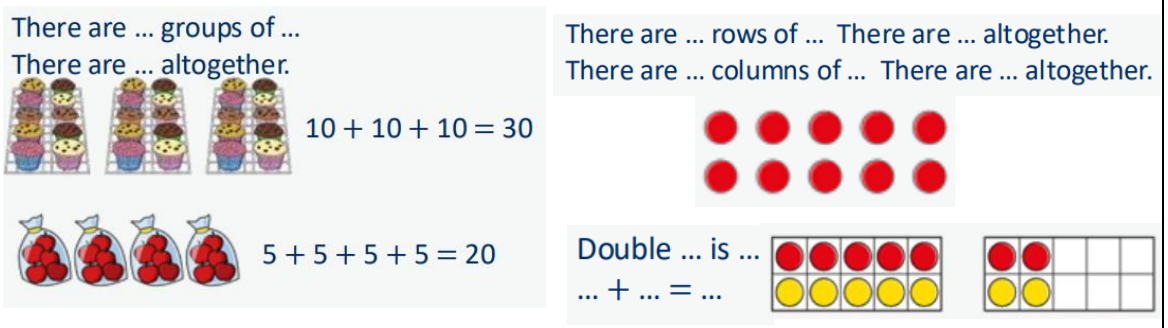
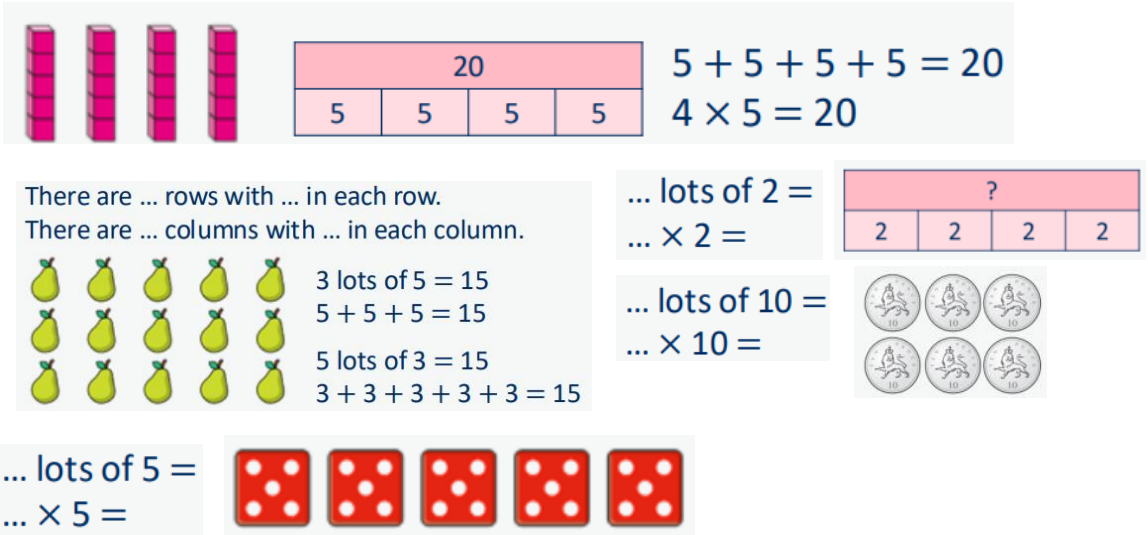
Year Group	Skill	Key Representations
Early Years	• Conceptually subitise to 5 • 1 less • Notice the composition of numbers within 10 • Partition • Take away	   

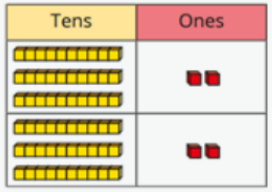
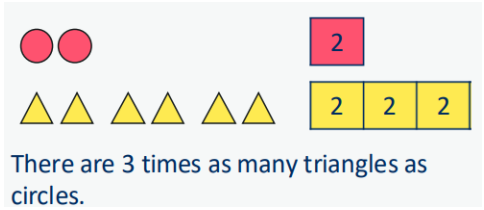
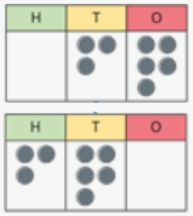
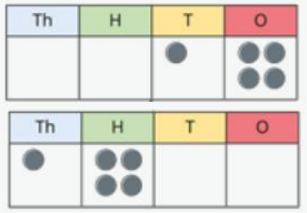
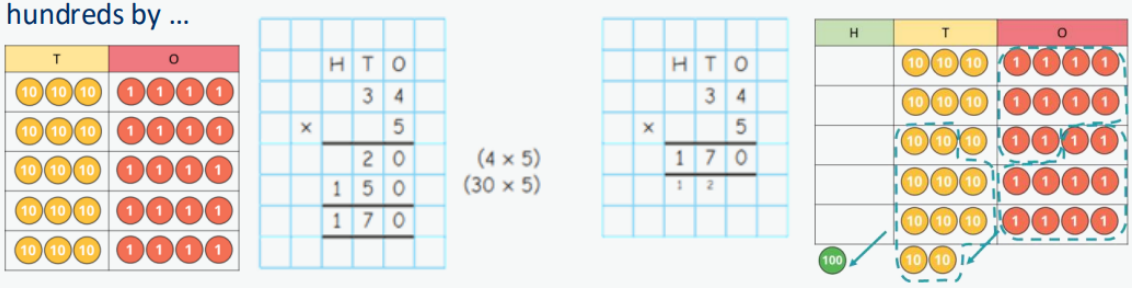
Year 1	• Find a part • Take away • Bonds within 10 • Related facts within 20 • Missing numbers	… is the whole. … is a part. … is a part.  First… Then… Now…  I know that … minus … = … so … minus … = …  If … is the whole and … is a part, the other part must be… 
Year 2	• Subtract 1s from any number • Subtract across a 10 • Subtract multiples of 10 • Subtract 10s from any number • Subtract two 2-digit numbers (not across 10 and across 10) • Missing numbers	I know that … minus … = … so … minus … = …  … can be partitioned into … and …  I need to make an exchange because I do not have enough ones to subtract … ones.  3 ones – 5 ones (I need to exchange 1 ten for 10 ones) 13 ones – 5 ones = 8 ones 3 tens – 2 tens = 1 ten 1 ten and 8 ones = 18

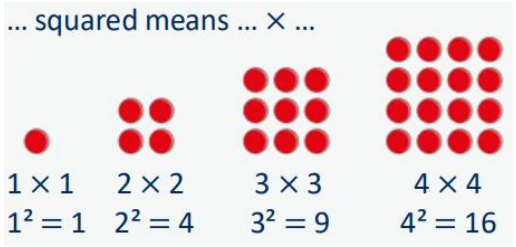
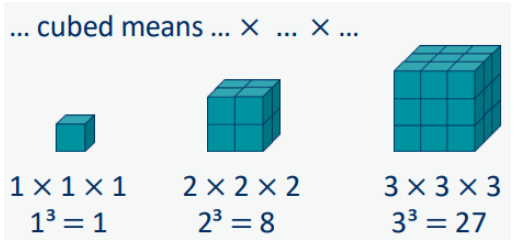
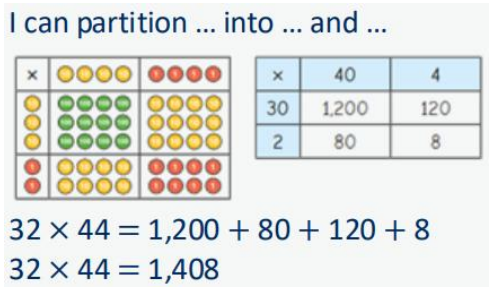
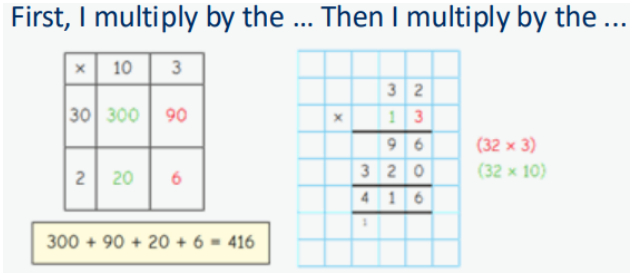
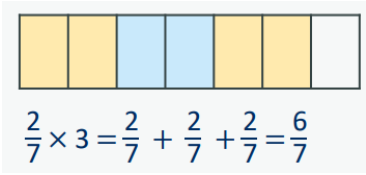
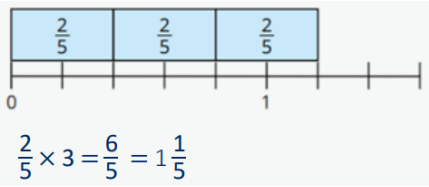
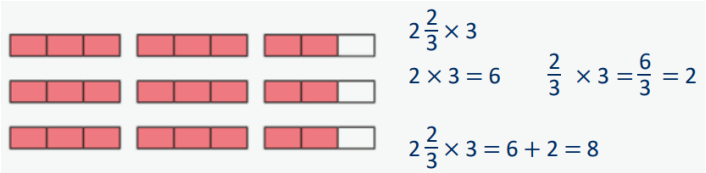
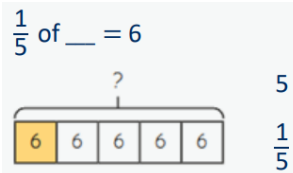
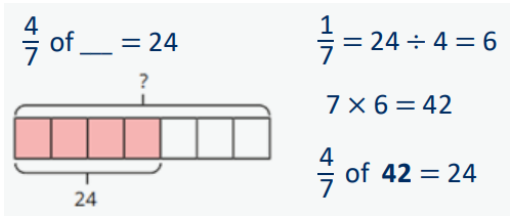
Year 3	• Subtract 1s, 10s and 100s from a 3-digit number • Subtract two numbers (no exchange) • Subtract two numbers across a 10 or 100 • Compliments to 100 • Subtract fractions with the same denominator within 1 whole	I need to subtract … ones. I do/do not need to make an exchange. I need to subtract … tens. I do/do not need to make an exchange. I can exchange 1 … for 10 …  When subtracting fractions with the same denominator, I only subtract the numerator. … fifths − … fifths = … fifths 
Year 4	• Subtract 1s, 10s, 100s and 1000s from a 4-digit number • Subtract up to 4-digit numbers • Subtract decimal numbers in the context of money • Subtract fractions and mixed numbers with the same denominator	I need to subtract… ones/tens/hundreds. I do/do not need to make an exchange. I can exchange 1… for 10…  £3.26 can be partitioned into £3 + 20p + 6p **£5 − £3.26**  

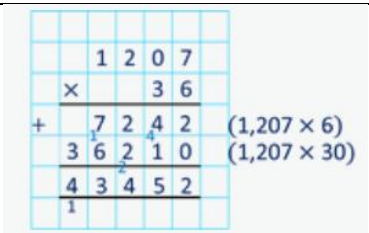
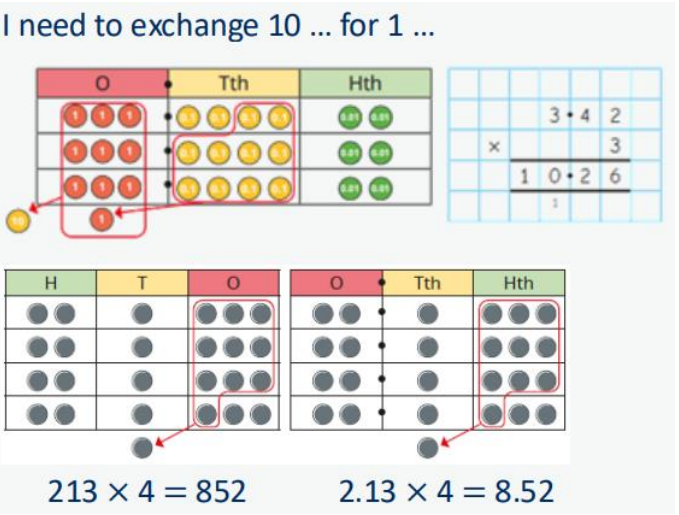
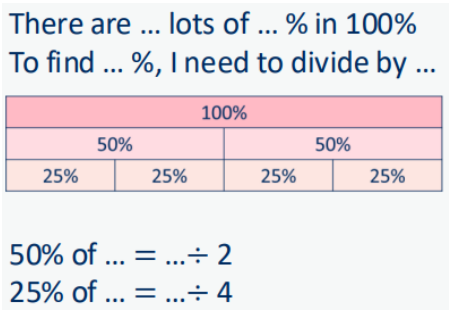
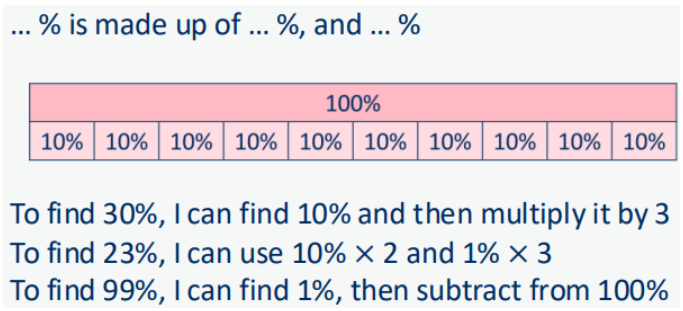
Year 5	• Subtract whole numbers with more than 4 digits • Subtract using mental strategies • Subtract decimals with up to 2 decimal places • Complements to 1 • Subtract fractions with denominators that are a multiple of one another	**No new methods taught with whole numbers**   
Year 6	• Subtract integers up to 10 million • Subtract decimals with up to 3 decimal places • Order of operations • Negative numbers • Subtract fractions	  

Multiplication

Year Group	Skill	Key Representations
Early Years	• Double to 10 • Make equal groups	
Year 1	• Count in 2s, 5s and 10s • Add equal groups • Make arrays • Make doubles	
Year 2	• Link repeated addition and multiplication • Use arrays • Double • The 2 times table • The 10 times table • The 5 times table • Missing numbers	

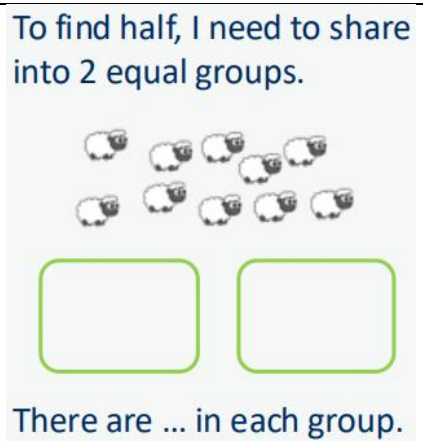
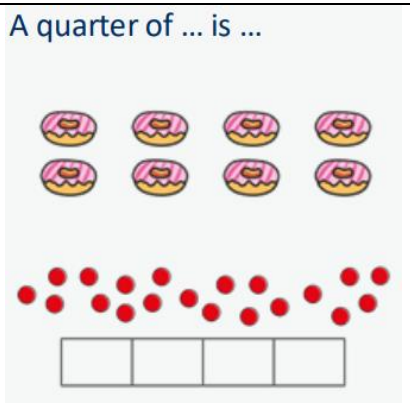
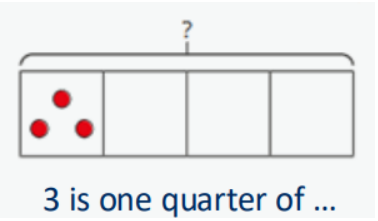
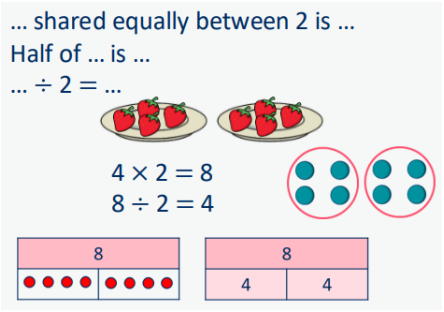
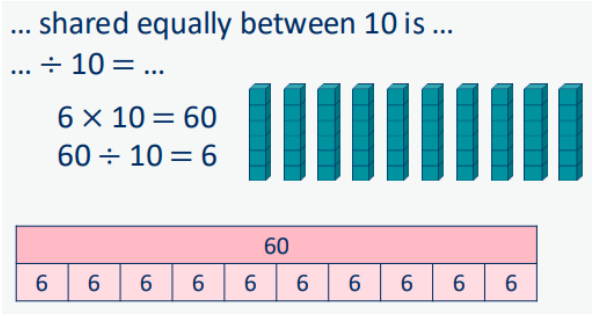
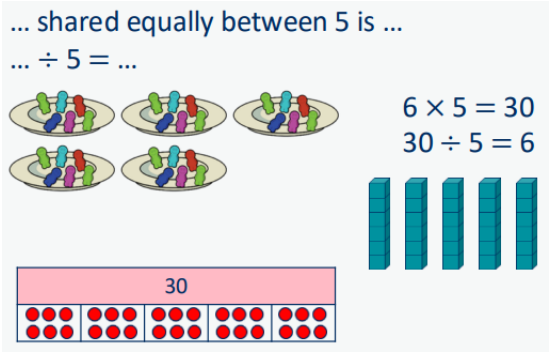
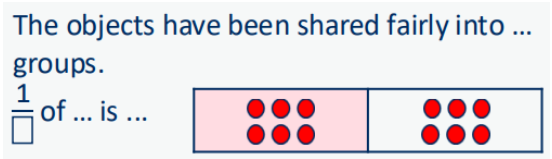
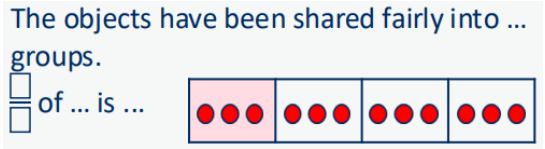
Year 3	• The 3 times table • The 4 times table • The 8 times table • Related facts • Multiply a 2-digit number by a 1-digit number (no exchange and exchange) • Scaling • Correspondence problems	… tens multiplied by … is equal to … tens. …ones multiplied by … is equal to … ones.  $30 \times 2 = 60$ $2 \times 2 = 4$ $32 \times 2 = 64$  There are 3 times as many triangles as circles. 
Year 4	• Times table facts to 12x12 • Multiply by 1 and 0 • Multiply 3 numbers • Factor pairs • Multiply by 10 and 100 • Related facts • Mental strategies • Multiply a 2 or 3-digit number by a 1-digit number • Scaling • Correspondence problems	When I multiply by 10, the digits move … place value column to the left. … is 10 times the size of …  $35 \times 10 = 350$ When I multiply by 100, the digits move … place value columns to the left. … is 100 times the size of …  $14 \times 100 = 1{,}400$ To multiply a 2-digit number by … , I multiply the ones by … and the tens by … To multiply a 3-digit number by … , I multiply the ones by … , the tens by … and the hundreds by … 

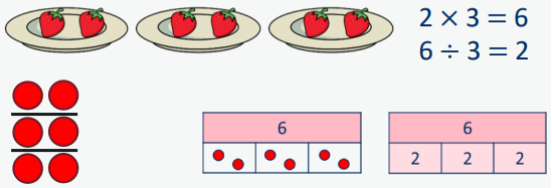
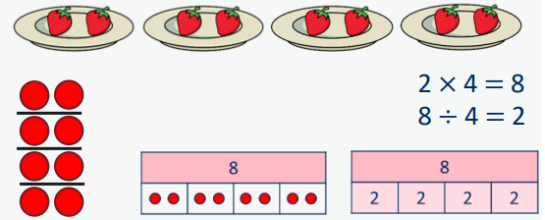
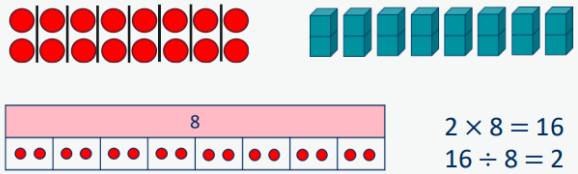
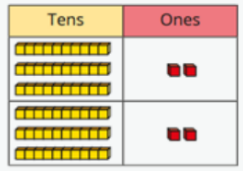
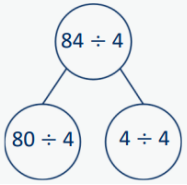
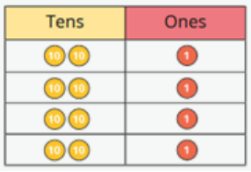
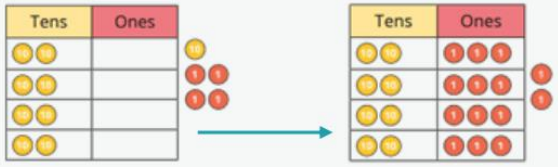
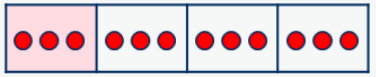
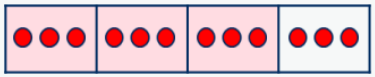
Year 5	• Multiples and factors • Square and cube numbers • Multiply numbers up to 4 digits by a 1-digit number • Multiply numbers up to 4 digits by a 2-digit number • Multiply by 10, 100 and 1000 • Mental strategies • Multiply fractions by a whole number • Multiply mixed numbers by a whole number • Find the whole	        

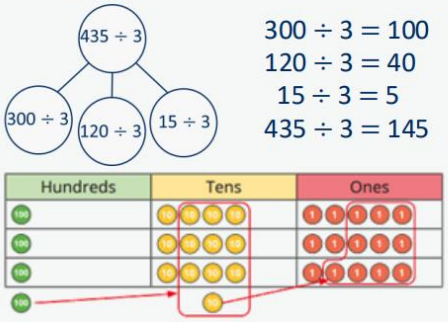
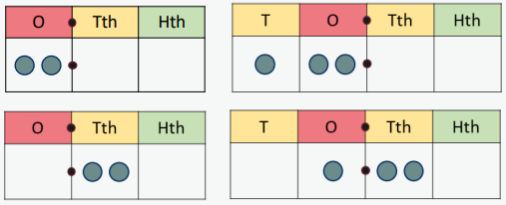
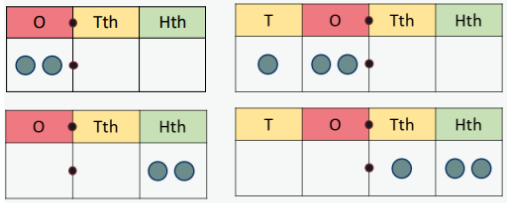
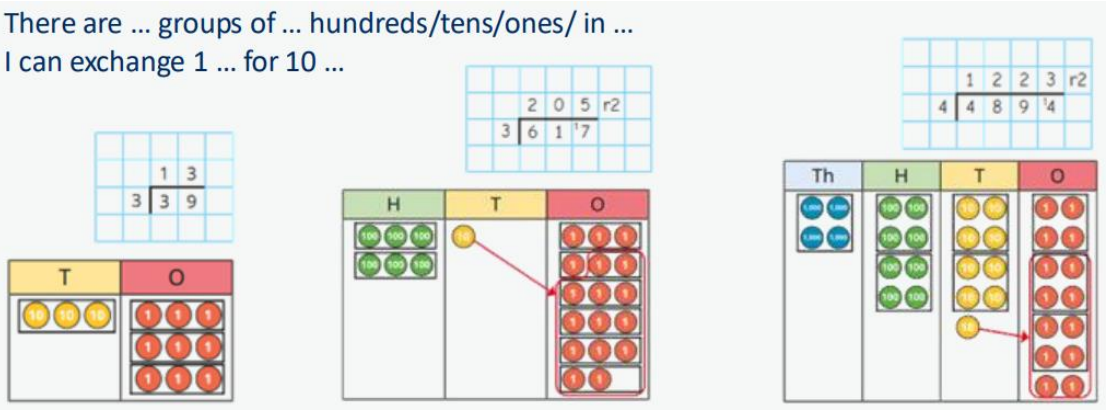
Year 6	• Multiply numbers up to 4 digits by a 2-digit number • Multiply by 10, 100 and 1000 • Order of operations • Multiply decimals by integers • Multiply fractions by fractions • Find the whole • Calculations involving ratio	 When multiplying a pair of fractions, I need to multiply the numerator and multiply the denominator. $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$   

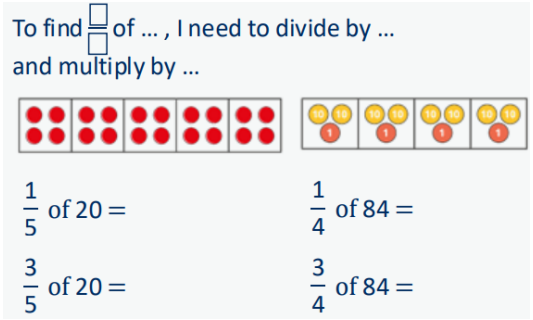
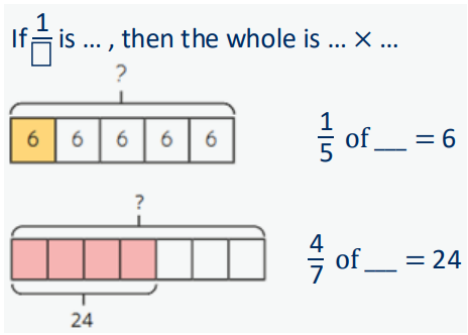
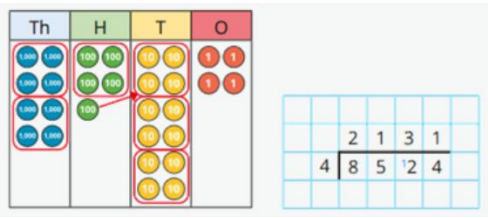
Division

Year Group	Skill	Key Representations
Early Years	• Sharing • Grouping	 There are … altogether. They are shared equally between … groups.  There are … groups of … There are … altogether.

Year 1	• Make equal groups – grouping • Make equal groups – sharing • Find a half • Find a quarter	  
Year 2	• Divide by 2, 5 and 10 • Missing Numbers • Unit fractions • Non-unit fractions	    

Year 3	• Divide by 3, 4 and 8 • Related facts • Divide a 2-digit number by a 1-digit number (no exchange) • Divide a 2-digit number by a 1-digit number (with remainders) • Unit fractions of a set of objects • Non-unit fractions of a set of objects	… has been shared equally into 3 equal groups. … ÷ 3 =  $2 \times 3 = 6$ $6 \div 3 = 2$ … has been shared equally into 4 equal groups. … ÷ 4 =  $2 \times 4 = 8$ $8 \div 4 = 2$ … has been shared equally into 8 equal groups. … ÷ 8 =  $2 \times 8 = 16$ $16 \div 8 = 2$ … tens divided by … is equal to … tens. … ones divided by … is equal to … ones.  $60 \div 2 = 30$ $4 \div 2 = 2$ $64 \div 2 = 32$   There are … groups of … There are … remaining. $31 \div 4 = 7$ r3  $94 \div 4 = 23$ r2  $\frac{1}{4}$ of 12 is 3  $\frac{3}{4}$ of 12 is 9 

Year 4	• Division facts to 12 x 12 • Divide a number by 1 and itself • Related facts • Divide a 2 or 3-digit number by a 1-digit number • Divide by 10 and 100	I cannot share the hundreds/tens equally, so I need to exchange 1 … for 10 …  When I divide by 10, the digits move 1 place value column to the right. … is one-tenth the size of …  When I divide by 100, the digits move 2 place value columns to the right. … is one-hundredth the size of … 
Year 5	• Mental strategies • Divide numbers up to 4 digits by a 1-digit number • Divide by 10, 100 and 1000 • Fraction of an amount	There are … groups of … hundreds/tens/ones/ in … I can exchange 1 … for 10 … 

		 
Year 6	• Short division • Mental strategies • Long division • Order of operations • Divide by 10, 100 and 1000 • Divide decimals by integers • Decimal and fraction equivalents • Divide a fraction by an integer • Fraction of an amount • Calculate percentages • Calculations involving ratio	 There are … groups of … hundreds/tens/ones/ in … I can exchange 1 … for 10 …