Progression in Calculations Policy

At our school, we believe **all children can succeed in mathematics**. Every child is taught the content for their year group, and instead of racing ahead, they deepen their understanding through problem-solving, discussion, and practical exploration.

Dartmoor Multi Academy Trust
...everyone in our Trust.

A key part of our approach is the **Concrete–Pictorial–Abstract (CPA)** model:

- **Concrete:** using objects and practical equipment
- **Pictorial:** using drawings, diagrams and visual models
- **Abstract:** using symbols and written methods

Children move flexibly between these stages, so they truly understand the maths, rather than simply memorising steps.

Children who grasp concepts quickly are challenged with **rich, sophisticated problems**, while those who need more time are given opportunities to **practise, revisit and secure earlier learning** before moving on.

We also place strong emphasis on **number fluency**, including quick recall of number bonds and times tables. These skills are essential for confident, accurate calculation and support pupils in meeting expectations such as the Year 4 Multiplication Tables Check.

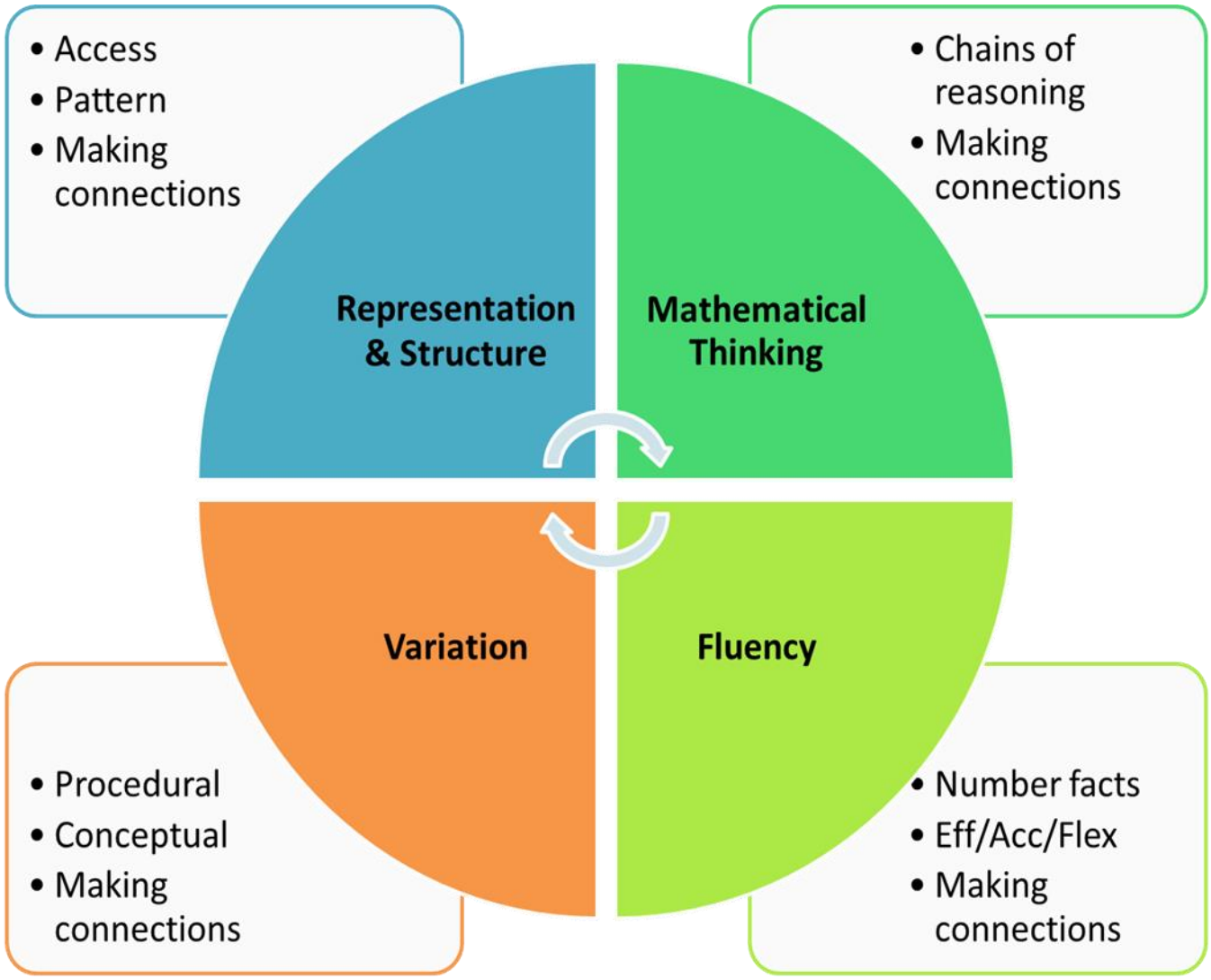
This policy shows how calculation strategies develop from **Reception to Year 6**, in line with the National Curriculum. It aims to help:

- **Teachers** plan clear, consistent progression
- **Parents and carers** understand the methods their child is learning

Although each year group has expected methods, teachers may revisit earlier strategies if children need more support.

The examples included here show *possible* concrete and pictorial models; teachers may use a range of resources to help children understand.

Progression in Calculations Policy



Progression in Calculations Policy

Progression in each calculation

	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Counting a set of objects. Knowing 1 more or 1 less Place numbers in order of size	Combining two parts to make a whole: part whole model Starting at the bigger number and counting on Regrouping to make 10	Adding three single digits. Column method – no regrouping	Column method- regrouping. (up to 3 digits)	Column method- regrouping. (up to 4 digits)	Column method- regrouping. (with more than 4 digits) (Decimals- with the same amount of decimal places)	Column method- regrouping. (Decimals- with different amounts of decimal places)
Subtraction	One less than / Taking away ones	Taking away ones Counting back Find the difference Part whole model Make 10	Counting back Find the difference Part whole model Make 10 Column method- no regrouping	Column method with regrouping. (up to 3 digits)	Column method with regrouping. (up to 4 digits)	Column method with regrouping. (with more than 4 digits) (Decimals- with the same amount of decimal places)	Column method with regrouping. (Decimals- with different amounts of decimal places)
Multiplication	Doubling	Doubling Counting in multiples Arrays (with support)	Doubling Counting in multiples Repeated addition Arrays- showing commutative multiplication	Counting in multiples Repeated addition Arrays- showing commutative multiplication Grid method	Column multiplication (2 and 3 digit multiplied by 1 digit)	Column multiplication (up to 4 digit numbers multiplied by 1 or 2 digits)	Column multiplication (multi digit up to 4 digits by a 2 digit number)
Division	Halving	Sharing objects equally Division as grouping	Division as grouping Division within arrays	Division within arrays Division with a remainder Short division (2 digits by 1 digit- concrete and pictorial)	Division within arrays Division with a remainder Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division (up to 4 digits by a 1 digit number interpret remainders appropriately for the context)	Short division Long division (up to 4 digits by a 2 digit number- interpret remainders as whole numbers, fractions or round)

Progression in Calculations Policy

Mathematical language

The National Curriculum emphasises the importance of children using **accurate mathematical language** as an essential part of their learning. In some year groups, the guidance specifically highlights the need for children to **develop and extend the vocabulary linked to new concepts**.

For this reason, it is vital that the strategies in this policy are always taught alongside **clear, correct mathematical vocabulary**. New terms should be introduced in a meaningful context — for example through real objects, practical equipment, pictures or diagrams — and explained carefully so children understand and can use them confidently.

High expectations of the mathematical language used are essential, with teachers only accepting what is correct.

Correct	Incorrect
ones	units
is equal to	equals
zero	oh (the letter O)

The expectation is that children will, at all times, answer in full sentences.

Sentence stems can be used to help children with this if required.

Acceptable	Not acceptable
The answer is 17	17
9 multiplied by 3 is 27	27

> The quality and variety of language that children hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof.
>
> *2014 Maths Programme of Study*

Progression in Calculations Policy

The "I do, we do, you do" approach is a well-established teaching method that helps children learn new skills gradually and confidently. It works particularly well in mathematics, where children need to build **understanding, fluency and problem-solving skills** at the same time.

I Do – Teacher Modelling
The teacher begins by **demonstrating** the new concept or method step by step.
This gives children a clear example to follow and shows them exactly what success looks like.

We Do – Guided Practice
Next, the teacher and children **work together**.
This shared practice allows pupils to try the method with support, ask questions and build confidence before working on their own.

You Do – Independent Practice

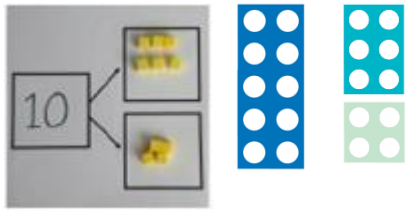
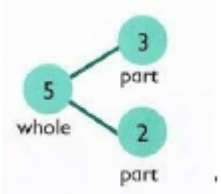
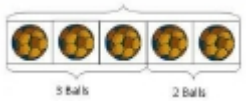
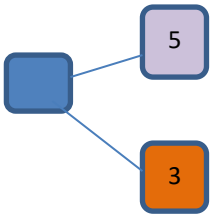
Finally, children **apply the learning independently**.
During this stage, the teacher checks understanding, provides feedback and uses what they observe to plan next steps or extra support if needed.

Progression in Calculations Policy

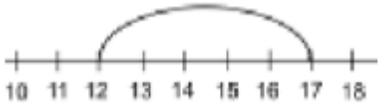
Addition

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 1 Yr R	Counting a set of objects Knowing 1 more or 1 less Place numbers in order of size	One more One less Bigger Larger			

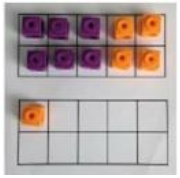
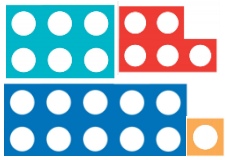
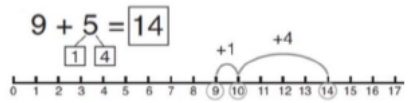
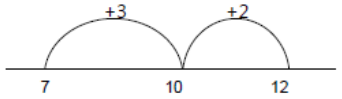
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 2 Yr R + 1	Combining two parts to make a whole: part-whole model	Addition Sum Total Parts and wholes Plus Add Altogether More than Equal to Same as	Use cubes to add two numbers together as a group or in a bar:  	Use pictures to add two numbers together as a group or in a bar:   	Use the part-part whole diagram as shown to move into the abstract:  4 + 3 = 7 10 = 6 + 4

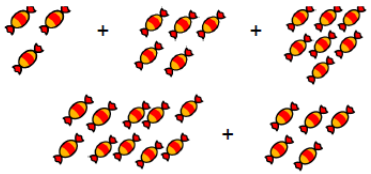
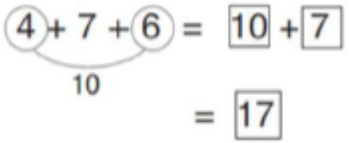
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 3 Yr 1	Start at the bigger number and count on		 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	Start at the larger number on the number line and count on in ones or in one jump to find the answer. 12 + 5 = 7 	Place the larger number in your head and count on the smaller number to find your answer. 5 + 12 = 17

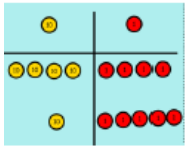
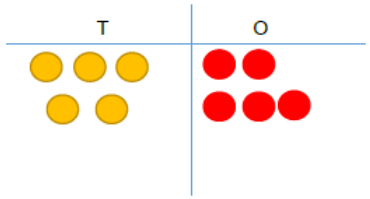
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary fo the Stage	Concrete	Pictorial	Abstract
Stage 4 Yr 1	Regrouping to make 10	Regroup Partition	Regroup 9 + 3 into 10 + 2 before adding together: Start with the larger number and use the smaller number to make 10  6 + 5 = 11 	Use pictures or a number line. Regroup or partition the smaller number to make 10 before adding. 3 + 9 =  Children move on to using an 'empty number line'. E.g. 7 + 5 becomes 7 + 3 + 2 	7 + 4 = 11 If I am at seven, how many more do I need to make 10? How many more do I add on now? 7 + 5 = 7 + 3 + 2 = 12

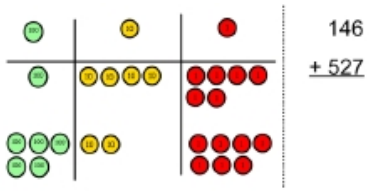
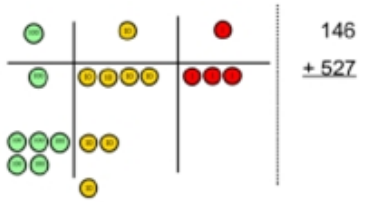
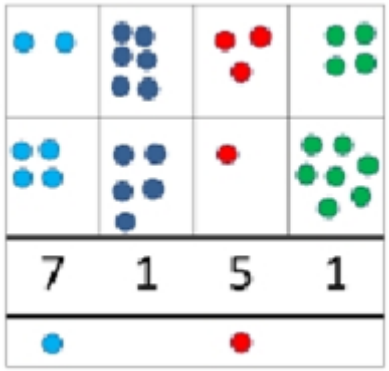
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 5 Yr 2	Adding three single digits	Addition Sum Total Parts and wholes Plus Add Altogether More than Equal to Same as	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7. Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.	 Combine the two numbers that make 10 and then add on the remainder.

Progression in Calculations Policy

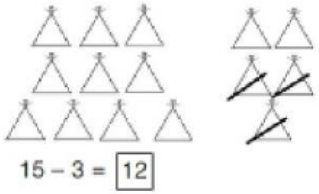
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 6 Yr 2	Column addition – without regrouping	Regroup Partition	Partition the numbers into tens and ones using base 10 blocks, place value counters. Add together the ones first then add the tens. Finally add the 2 totals together. 24 + 15 = 39 44 + 15 =  59	After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 32 + 23 = 55  	21 + 42 = 21 + 42 Record the calculation vertically adding the column of ones then the column of tens.

Progression in Calculations Policy

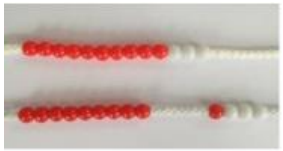
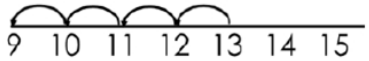
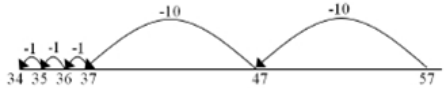
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 7 Yr 3 (3 digits) Yr 4 (4 digits) Yr 5 + (4+ digits and decimals with same np. dp) Yr 6 (decimals with difft no. dp)	Column addition – with regrouping	Exchange Regroup Partition	Make both numbers with place value counters.  Add up the ones and exchange 10 ones for one 10. Add it to the other tens:  Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100. As children move on to decimals, money and decimal place value counters can be used to support learning.	Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.  	Begin by partitioning the numbers: For 76 + 47 70 + 6 40 + 7 110 + 13 = 123 Move on to clearly show the exchange below the addition: 70 + 6 40 + 7 120 + 3 = 123 10 This then becomes the compact method where numbers aren't partitioned but exchanges still take place: 76 + 47 123 1 1 As the children move on, introduce decimals with and without the same number of decimal places. Money can also be used here. 72.8 + 54.6 127.4 1 1 2 3 . 3 6 1 9 . 0 8 0 5 9 . 7 7 0 + 1 . 3 0 0 9 3 . 5 1 1 2 1 2 **N.B. Exchanged digits need to be recorded below the line when adding.**

Progression in Calculations Policy

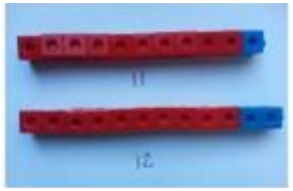
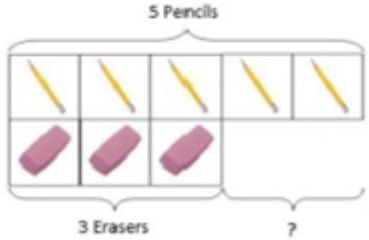
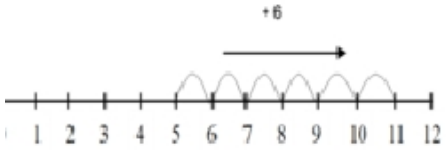
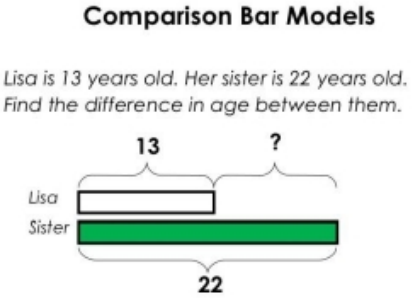
Subtraction

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 1 Yr R Yr 1	One less than / Taking away ones	One less Take away Less than The difference Subtract Minus Fewer Decrease	Use physical objects, counters, cubes numicon, etc, to show how objects can be taken away. 6 – 2 = 4 	Cross out drawn objects to show what has been taken away.  15 – 3 = 12 4 – 2 = 2	18 – 3 = 15 8 – 2 = 6 Although number sentences are recorded in the concrete and pictorial methods children are introduced to them on their own while encouraging them to mentally take away ones.

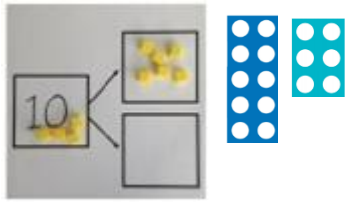
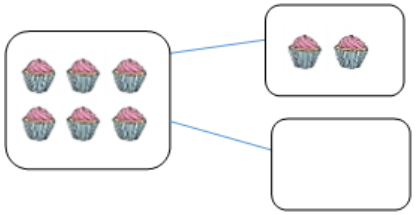
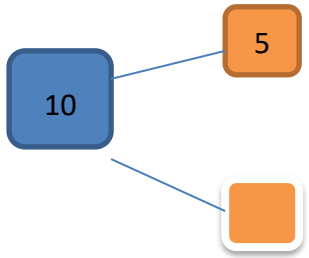
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 2 Yr R Yr 1 Yr 2	Counting back	One less Take away Less than The difference Subtract Minus Fewer Decrease	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 13 – 4  Use counters and move them away from the group as you take them away counting backwards as you go.	Count back on a number line or number track  Start at the bigger number and count back the smaller number showing the jumps on the number line.  This can progress all the way to counting back using two 2-digit numbers.	For 13 – 4, put 13 in your head and count back 4. What number are you at? Use your fingers to help.

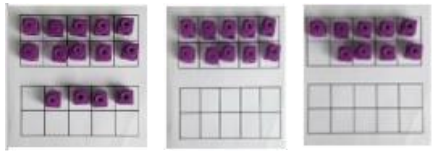
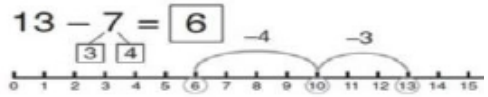
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 3 Yr 1 Yr 2	Find the difference	One less Take away Less than The difference Subtract Minus Fewer Decrease	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference.  Use basic bar models with items to find the difference.	Count on to find the difference:  Draw bars to find the difference between 2 numbers.  	Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.

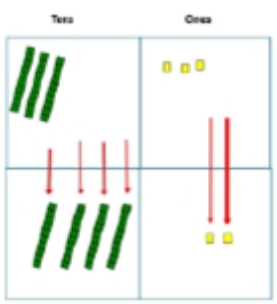
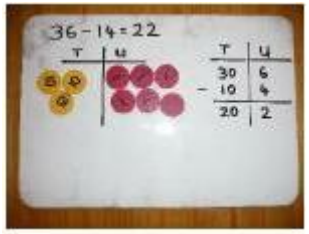
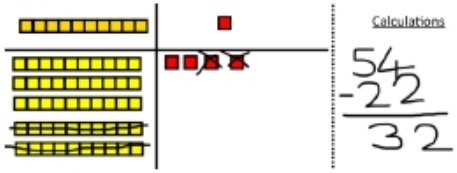
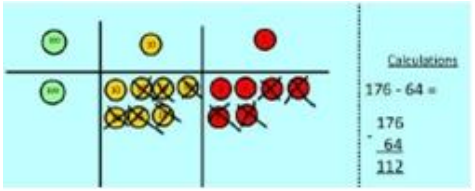
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 4 Yr 1 Yr 2	Part Whole Model	Part Whole Inverse	Link to addition - use the part whole model to help explain the inverse between addition and subtraction.  If 10 is the whole and 6 is one of the parts. What is the other part? 10 – 6 =	Use a pictorial representation of objects to show the part whole model.  6 – 2 = 4	 Move to using numbers within the part whole model.

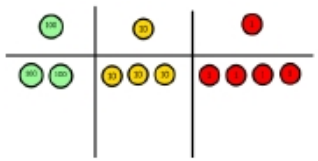
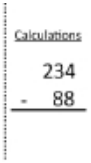
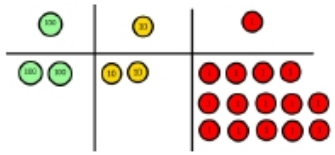
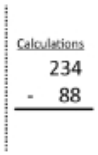
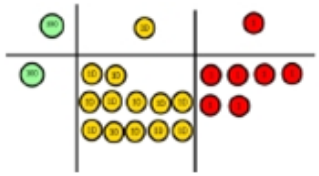
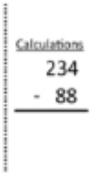
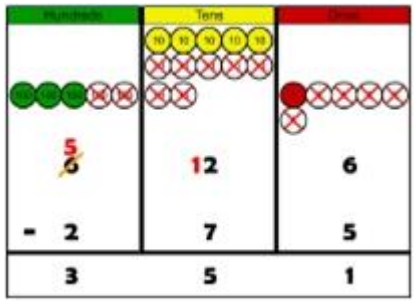
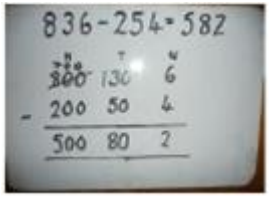
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 5 Yr 1 Yr 2	Make 10	Ten frame Remaining Take off Count back	14 – 5 =  Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.	Start at 13. Count back 3 to reach 10. Then count back the remaining 4 so you have taken away 7 altogether. You have reached your answer. 	16 – 8 = How many do we take off to reach the previous 10? (6) How many do we have left to take off? (2)

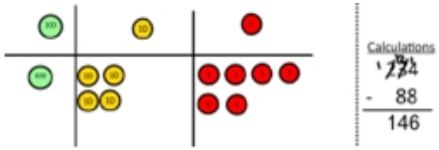
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 6 Yr 2	Column method without regrouping	Column Partition Larger	75 - 42  Use Base 10 to make the bigger number then take the smaller number away. Show how you partition  numbers to subtract. Again make the larger number first.	Draw the Base 10 or place value counters alongside the written calculation to help to show working:   	Partitioned numbers are written vertically: For 54 – 22 Tens Ones 50 4 - 20 2 30 + 2 = 32 This will lead to a clear written column subtraction: 32 - 12 20

Progression in Calculations Policy

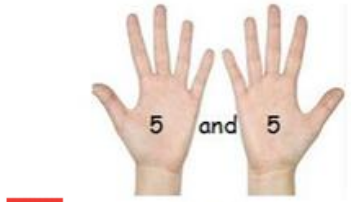
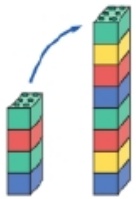
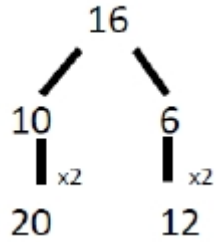
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 7 Yr 3 (3 digits) Yr 4 (4 digits) Yr 5 + (4+ digits and decimals with same np. dp) Yr 6 (decimals with difft no. dp)	Column method with regrouping	Exchange Partition	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the place value counters.   Calculations 234 - 88 Start with the ones, can I take away 8 from 4 easily? I can't take away 8 ones. I need to exchange one of my tens for ten ones.   Calculations 234 - 88 Now I can subtract 8 ones from 14. Next look at the tens. I can't take away 8 tens. I need to exchange a hundred for 10 tens:   Calculations 234 - 88	Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make:  When confident, children can find their own way to record the exchange/regrouping: Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.	 Children can start their formal written method by partitioning the number into clear place value columns. Moving forward the children use a more compact method. This will lead to an understanding of subtracting any number including decimals: 5 12 2 6 3 . 0 - 2 6 . 5 2 3 6 . 5

Progression in Calculations Policy

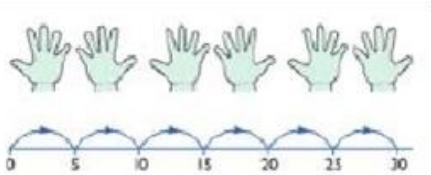
			Now I can take eight tens from the 12 tens and complete the subtraction.  Show children how the concrete method links to the written method alongside their working. Cross out the numbers when exchanging and show where we write our new amount.		

Progression in Calculations Policy

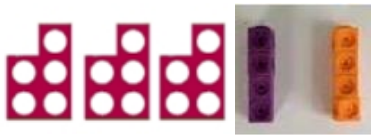
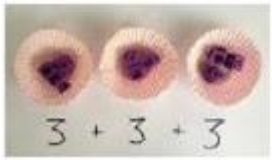
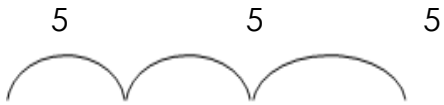
Multiplication

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 1 Yr R Yr 1 Yr 2	Doubling	Double Count on (from, to) Count back (from, to) Count in ones, twos, tens… Is the same as	Use practical activities to show how to double a number.   	Draw pictures to show how to double a number.	 Partition a number and then double each part before recombining it back together. 4 x 2 = 8

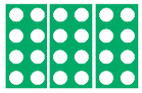
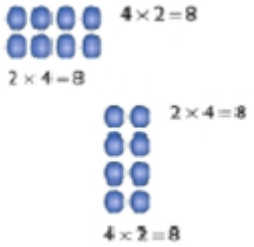
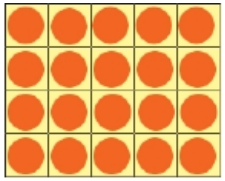
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabular for the Stage	Concrete	Pictorial	Abstract
Stage 2 Yr R Yr 1 + Yr 2 (x2, 5, 10) Yr3 (x3, 4, 8)	Counting in multiples	Multiplied by The product of Groups of Lots of Is equal to	Count in multiples supported by concrete objects in equal groups. 	 Use a number line or pictures to continue support in counting in multiples.	Count out loud in multiples of a number. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

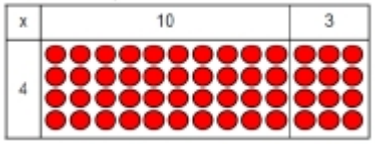
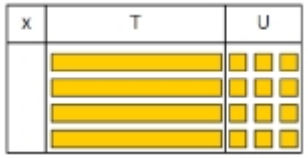
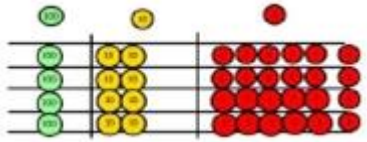
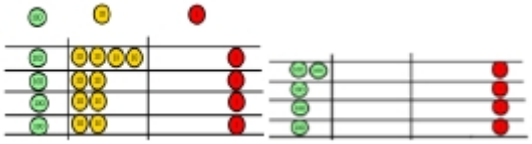
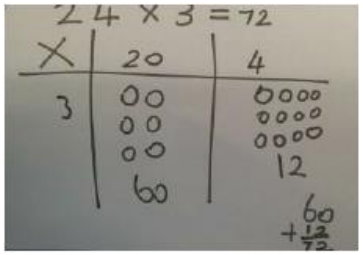
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 3 Yr 2 Yr 3	Repeated addition		Use different objects to add equal groups.   	There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? 2 add 2 add 2 equals 6 Repeated addition can be shown on a labelled or empty number line. Eg 5 + 5 + 5 = 15:  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Begin to relate repeated addition to multiplication using 'lots of'. e.g. 3 lots of 5 = 15	Write addition sentences to describe objects and pictures. This then leads to writing related multiplication sentences e.g. 2 x 5 = 10

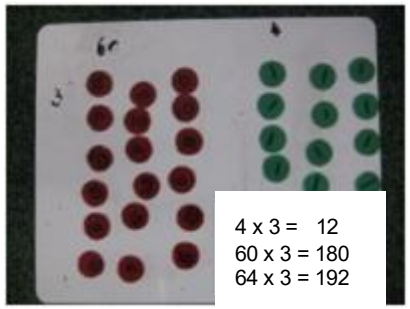
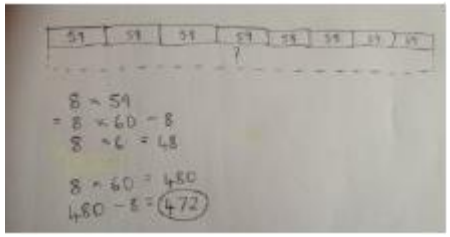
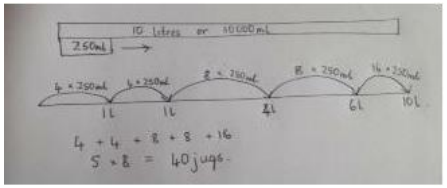
Progression in Calculations Policy

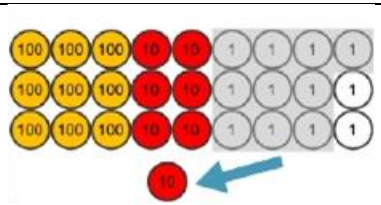
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 4 (Yr 1) Yr 2 Yr 3	Arrays - showing commutative multiplication	Array Commutative	Create arrays using counters /cubes /numicon to show multiplication sentences. Eg 4 x 6 = 24  Begin to look at arrays in different orientations to make the link between. Eg 5 x 3 = 15 and 3 x 5 = 15 (commutativity)	Draw arrays in different rotations to find **commutative** multiplication sentences.  Link arrays to area of rectangles: 	Use an array to write multiplication sentences and reinforce repeated addition. 5 + 5+5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 5 Yr 3	Grid Method	Grid Exchange	Show the link with arrays to first introduce the grid method. Eg 4 x 13 4 rows of 10; 4 rows of 3  Move on to using Base 10 to move towards a more compact method:  4 rows of 13 Move on to place value counters to show how we are finding groups of a number. Here, we are multiplying 126 by 4 so we need 4 rows with each containing 26. Fill each row with 126.  Add up each column, starting with the ones making any exchanges needed. Then you have your answer. 	Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below:  	Start with multiplying 2-digit by 1-digit numbers and showing the addition alongside the grid: | ×	30	5
---	---	---
7	210	35	 210 + 35 = 245 Moving forward, multiply by 2, 3 and 4-digit numbers showing the different rows within the grid method: 13 x 28 	X	20	8
---	---	---
10	200	80
3	60	24 | 280 + 84 364 Eg 1342 x 18 1 | X	1000	300	40	2
---	---	---	---	---
10	10000	3000	400	20
8	8000	2400	320	16	 1

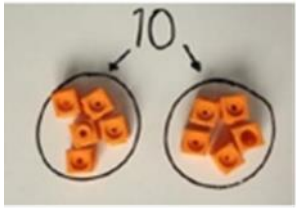
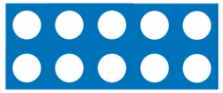
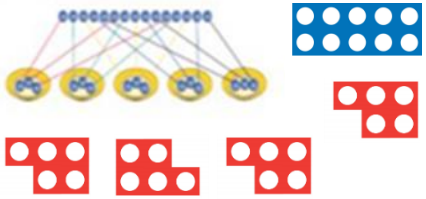
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 6 Yr4 (2 and 3 digit x 1 digit) Yr 5 (4 digits x 1 or 2 digits) Yr 6 (4 digits x 2 digits)	Column multiplication	Column multiplication	Children can continue to be supported by place value counters for carrying out column multiplication. They can partition and record each calculation vertically.  It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below. The idea of exchanging will support them in moving on to a more compact method: Eg 3 x 324	Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.   As with stage 4, children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different	Start with long multiplication, reminding the children about lining up their numbers clearly in columns. As with the grid method, numbers of more than one digit are partitioned but this time the calculation is recorded vertically. To support them, children need to write out what they are solving next to their answer. Eg 38 x 7 38 X 7 56 (8 x 7) 210 (30 x 7) 266 32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 This moves to the more compact method, examples shown overleaf. Start by multiplying the ones digit, recording the last digit of the answer in the answer line but exchanging any tens and putting them under the tens column to be added on after multiplying the tens digit. Again, the

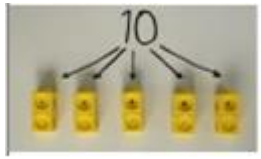
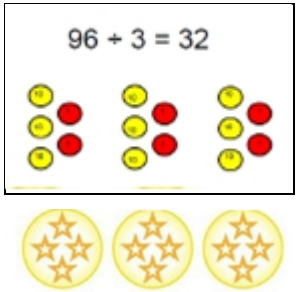
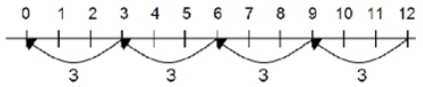
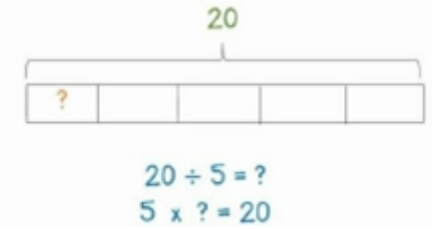
				columns to show their thinking.	last digit in the answer is recorded in the answer line and any hundred are exchanged, this time to the hundreds column, and so on. Eg 38 x 7 38 X 7 266 5 Eg 38 x 27 38 X 27 266 (38 x 7) 760 (38 x 20) 1026 1

Progression in Calculations Policy

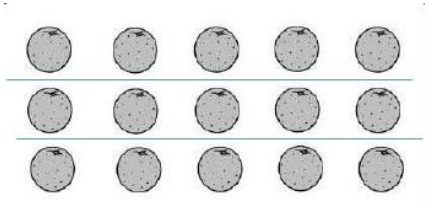
Division

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 1 Yr R	Halving	Half Halve Count out Share out Left Left over …is the same a Equal	  	One sweet for you, one for me… Is it fair? How many do we each have? 	
Stage 2 Yr R Yr 1	Sharing objects Equally	Share Group Divide Half Halve Count out Share out Left Left over Is the same as Is equal to	I have 10 cubes; can you share them equally into 2 groups? 15 shared between 5 is 3: 	Children use pictures or shapes to share quantities. 8 ÷ 2 = 4 How many groups of 4 are there in 12 stars? 	Share 9 buns between three People: 9 ÷ 3 = 3

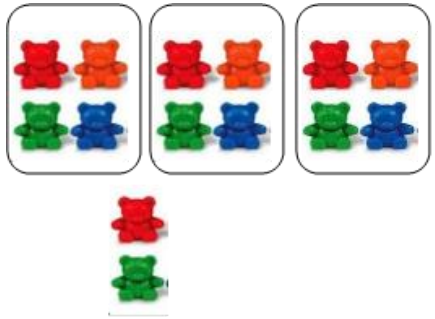
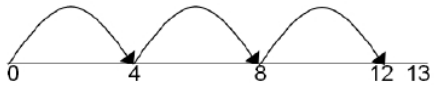
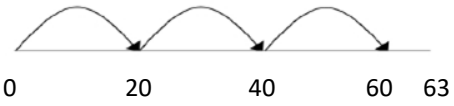
Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 3 Yr 1 Yr 2	Division as grouping	Equal groups	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  There are 10 sweets. How many people can have 2 sweets each?  	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.  	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?

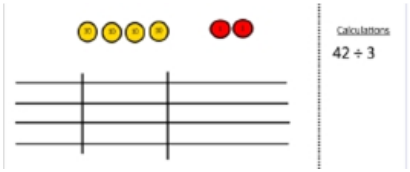
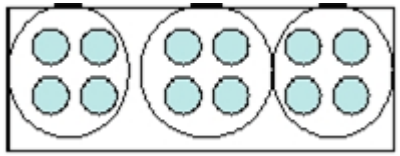
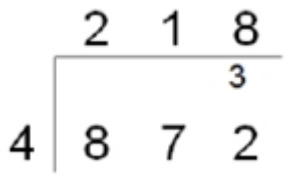
Progression in Calculations Policy

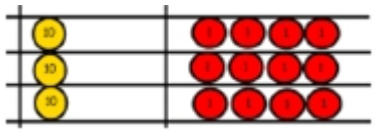
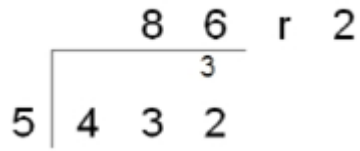
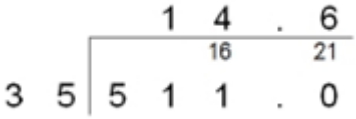
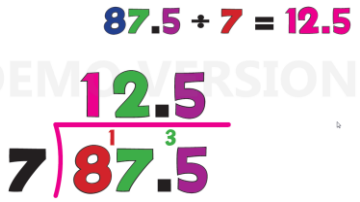
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 4 Yr 2 Yr 3 Yr 4	Division within arrays	Array Inverse	Link division to multiplication by creating an array and thinking about the number sentences that can be created: Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	 Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7

Progression in Calculations Policy

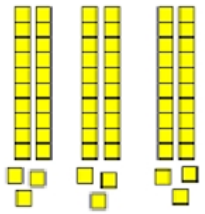
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 5 Yr 3 Yr 4	Division with a remainder	Remainder Equal jumps	14 ÷ 3 = Divide objects into groups or share equally and see how much is left over: 	Draw dots and group them to divide an amount and clearly show a remainder: Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder. 13 ÷ 4 = 3 r1  As knowledge of place value improves, children can begin to jump in multiples of 10: 63 ÷ 2 = 30 r3  	Children use knowledge of times table facts to quickly calculate divisions involving remainders. For example: 27 ÷ 5 = 5 r2 Go on to combining knowledge of times tables with place value to calculate more difficult divisions. For example: 137 ÷ 4 = 34 r1

Progression in Calculations Policy

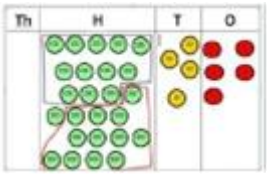
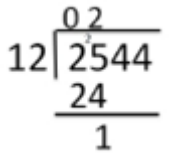
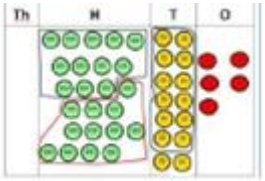
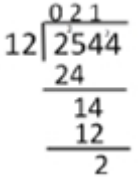
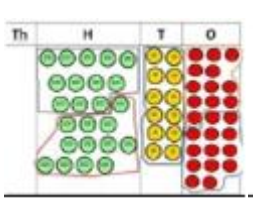
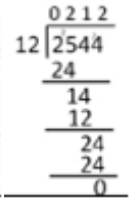
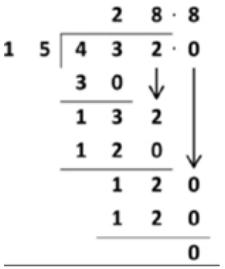
Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 6 Yr3 (2 digit by 1 digit) Yr4 (up to 3 digits by 1 digit) Yr5 (up to 4 digits by a 1 digit remainder. Interpret	Short division	Bus stop method	Use place value counters to divide using the bus stop method alongside: 42 ÷ 3= Start with the biggest place value; we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over:  	Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with no remainder: 72 ÷ 4 = 18 872 ÷ 4 = 218:  Move onto divisions with a remainder: 65 ÷ 4 = 16r1 432 ÷ 5 = 86 r2:

remainders based on context)			We exchange this ten for ten ones and then share the ones equally among the groups: We look at how much is in 1 group, so the answer is 14: 		 Finally move into decimal places to divide the total accurately. 511 ÷ 35 = 14.6:  

Progression in Calculations Policy

Yr/ Stage	Strategy/ Method	New Vocabulary for the Stage	Concrete	Pictorial	Abstract
Stage 7 Yr6 (up to 4 digits by a 2 digit remainder. Interpret remainders as whole numbers, fractions or round)	Long division		It is recommended that instead of using physical counters, students can draw the counters and circle the groups on a whiteboard or in their books. → If needed: 71 ÷ 3 = Using Base 10 or place value counters, we start with 7 tens and 1 one, to be divided into 3 groups. We can put 2 tens in each group, so we write a 2 in the tens column. In all, we've put 6 tens into the groups (3 x 2 tens), so we write 6 tens (60) below. We are left with 11 (1 ten and 1 one). We will need to exchange the ten for 10 ones so we can put 3 ones in each group (using 9 ones in all), and we will have a remainder of 2.  23 R.2 3)71 -60 11 -9 2	Use this method to explain what is happening and as soon as they have understood what move on to the abstract method as this can be a time consuming process: Eg. 2544 ÷ 12 How many groups of 12 thousands do we have? None Exchange 2 thousand for 20 hundreds: 0 12|2544 How many groups of 12 are in 25 hundreds? 2 groups. Circle them.	0 3 1 8 r5 20|6 3 6 5 −6 0 3 6 −2 0 1 6 5 −1 6 0 5 432 ÷ 15 becomes 2 8 r 12 1 5|4 3 2 3 0 0 1 3 2 1 2 0 1 2 Answer: 28 remainder 12 432 ÷ 15 becomes 2 8 1 5|4 3 2 3 0 0 15×20 1 3 2 1 2 0 15×8 1 2 Answer: $28\frac{4}{5}$ $\frac{12}{15} = \frac{4}{5}$

Progression in Calculations Policy

				We have grouped 24 hundreds so can take them off and we are left with one:   Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2:   Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2   	432 ÷ 15 becomes  Answer: 28·8

Progression in Calculations Policy

Appendix: Additional guidance adapted from 'Calculation guidance' by NCETM, published October 2015.

Fluency in maths depends on children being able to **quickly and accurately recall key number facts**, such as number bonds to 20 and multiplication tables. Practising these for a **short time every day** helps children build strong mental foundations.

Whole-class chanting or quick recall activities are not "mindless repetition" — they help children **spot patterns and connections** between facts. For example, the answers in the 6× table are double those in the 3× table. Seeing these relationships builds a deeper understanding of how numbers work and strengthens long-term fluency.

Some education systems, such as Shanghai, introduce multiplication tables in a specific order to make these connections clearer. At our school, we expect children to **practise number facts daily** so they become confident and fluent.

Developing Mental Calculation Fluency (The "Magic 10")

Efficient mental maths relies on having a range of quick strategies. One key idea is the importance of **making 10**. Children learn to "bridge through 10" by partitioning numbers to make calculations easier. For example:

- 9 + 6 can be thought of as **9 + 1 + 5 = 10 + 5 = 15**

This is known as the **"Magic 10"**. It helps children move beyond simply counting on their fingers and instead use **number relationships** to calculate quickly.

For example, instead of counting on for:

- 4 + 7
  A child can reason that:
- 4 + 6 makes **10**, so 4 + 7 must be **11**.

Helping children use these mental strategies early on builds confidence, reduces dependence on counting, and prepares them for more complex calculations later on.

Progression in Calculations Policy

Understanding the "=" Symbol

It is important that children learn the true meaning of the **equals (=) symbol**. The = sign does *not* mean "write the answer here". It means **"is the same as"** or **"is equal to"**.

For example:

- **3 + 4 = 6 + 1**
  This means that the value on the left is **equal** to the value on the right.

Many children only see examples like:

- 3 + 4 =
- 5 × 7 =
- 16 – 9 =

Because of this, they sometimes think = simply tells them to "work out the answer", rather than showing a relationship between two equal expressions.

This can cause confusion with questions such as:

- **3 + □ = 8**

and later with algebra:

- **3y = 18**

To help children build a correct understanding, teachers use visual models such as **balance scales**, which show that both sides must balance because they are equal.

In some countries, including China, children see the = symbol used in different positions from an early age and solve missing-number problems regularly. This strengthens their understanding that the = symbol represents **equivalence**, not just "the answer goes here".

Progression in Calculations Policy

Using Intelligent Practice

In high-quality maths teaching, practice is important — but it should never be **mindless repetition**. Instead, children benefit from *intelligent practice*: tasks that help them spot patterns, make connections and think deeply about the maths they are doing.

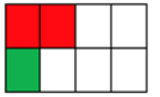
This type of practice strengthens both:

- **Procedural fluency** (carrying out calculations confidently)
- **Conceptual understanding** (knowing *why* methods work)

Intelligent practice encourages children to reason, compare calculations and look for relationships between them. This leads to stronger long-term fluency.

Moving Between Concrete and Abstract Representations

Children understand maths more securely when they see ideas represented in **different ways**:



- **Concrete** – using real objects or manipulatives
- **Pictorial** – using drawings, images or diagrams
- **Abstract** – using symbols and written methods

Effective teaching moves between these representations during a lesson, helping children connect the abstract symbols to something meaningful and familiar.

For example, when adding fractions, children may be asked to:

- **Draw a picture** to represent the calculation
- Or later, **choose the correct visual model** from several options and explain their reasoning

These activities help children make sense of the maths and build confidence using abstract notation.

Progression in Calculations Policy

Contextualising the Mathematics

Children understand new ideas more securely when maths is linked to **real-life contexts**. For example, a lesson on addition and subtraction might begin with a simple story:

"There are 11 people on a bus. At the next stop, 4 people get on. At the following stop, 6 people get off. How many people are now on the bus?"

This kind of story helps children make sense of what addition and subtraction mean in a familiar situation.

Throughout the lesson, the teacher keeps returning to the story so children can connect the numbers in a calculation with what is happening. For example, if children are working on:

14 – 8

the teacher might ask:

- "What does the 14 represent?"
- "What does the 8 represent?"

Children should be able to explain:
"*There were 14 people on the bus, and 8 is the number who got off.*"

Asking children to interpret the meaning behind calculations—such as explaining **7 + 7 = 14** using the story—helps teachers check how deeply children understand the maths and whether they can link **concrete contexts** with **abstract symbols**.