
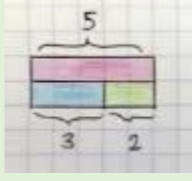
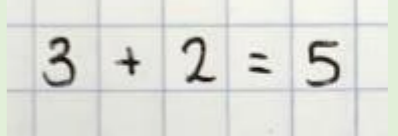
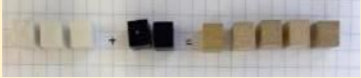
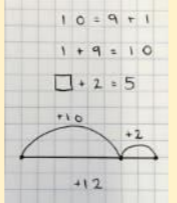
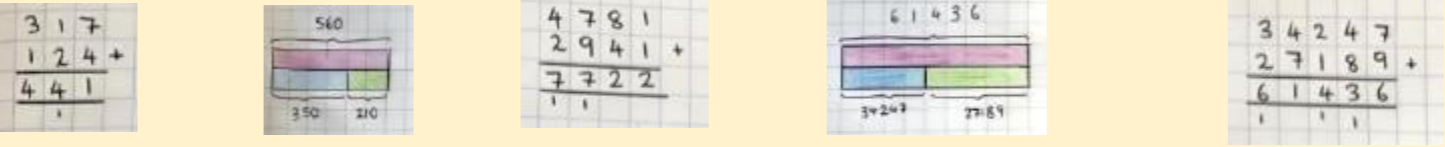
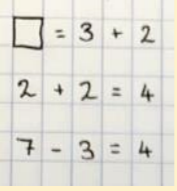
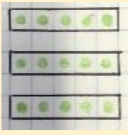
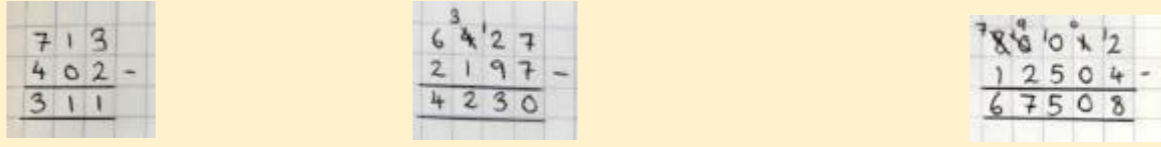
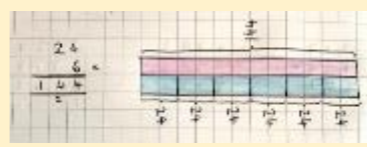
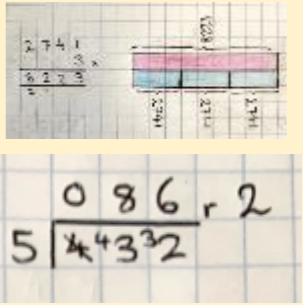
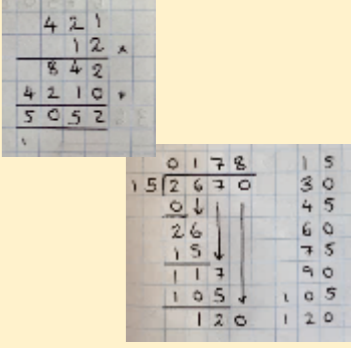



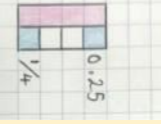


Willow Brook Maths Model of Learning & Calculation Policy (Appendix 1)

Concrete Pupils manipulate hands-on, concrete materials so they can see their learning.	Pictorial Pupils draw and observe diagrams or watch the teacher touching and moving hands-on materials.	Abstract Pupils use numbers and mathematical symbols
		

Area of Learning	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	In addition and subtraction, we cover lots of concrete and pictorial examples alongside focused number formation using a tripod grip. Some of the strategies we use are: Composition of Number Number bonds (2 + 3 = 5) We sing songs	In addition and subtraction, we focus on number bonds within 20. We gain deeper understanding by using our fingers for fast recall, number lines and concrete resources. 	In our addition and subtraction lessons we'll start off by using concrete examples, then look at pictorial representations. After, we'll move onto more formal methods for calculating our answers. We'll use number lines, base ten and mental methods to help us. 	In our addition lessons we set out our work in a straight line, placing each digit in a box. As we progress through the school we use more formal written methods, such as column addition to increase speed and automaticity in calculating answers. 			
Subtraction	Counting on and backwards using a stick or a number line, e.g. The number of frogs on a lily pad or polar bears on an iceberg!	We start looking at and using arrays. We also use diagrams to help answer questions like, 'how many groups of 3 are there?' 	We start by looking at the 2s, 5s and 10s and use our knowledge of multiples (2, 3, 5 and 10). We use words such as 'lots of' when calculating $3 \times 5 = 15$. 	When a calculation cannot be solved mentally children should write down the calculation using a straight line 	As the calculations become more complex, we move to a more formal method of calculation. 	As children move into year five, they include larger numbers and begin to look at long multiplication and more complex short division 	When children arrive in year six, they master the strategies for long multiplication and long division. 
Multiplication	We begin to look at doubling numbers using concrete and pictorial examples.	In division we'll use concrete resources to help us <i>share</i> out sweets. For example, 'Out of 20 sweets, how many will 5 friends each receive?' 	In division, we use the vocabulary of 'shared' and 'groups of'. We then use our knowledge of multiples to help us spot the associated division facts. $3 \times 4 = 12$ $12 \div 4 = 3$				
Division	We begin to look at equal groups, using language such as 'sharing' and 'fairness' in our lessons. For instance, sharing cakes between children. We even talk about 'one left over'.						
Fractions	We begin to talk about halving numbers using concrete and pictorial examples.	In our work looking at fractions, we'll explore $\frac{1}{2}, \frac{1}{4}, \frac{2}{4}$ in words and discuss terms like 'equal parts', 'split into half', 'split into quarters' and 'one whole'. 	In fractions we learn about $\frac{1}{4}, \frac{3}{4}, \frac{1}{3}, \frac{2}{4}$ and discuss pictures showing groups of objects. We'll also look at fractions of shapes. 	In years 3 and 4, children will record their work using a box for the numerator and denominator separately. They will use concrete examples to shore up their understanding before moving through pictorial then abstract. $\frac{1}{4} = 0.25$ 		In years 5 and 6, children will start writing their fractions in one box, keeping their presentation neat and accurate. We will still use concrete and pictorial examples to aid learning but move towards using abstract representations to show our calculations. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ $3\frac{1}{2} \div 4\frac{3}{4} = 8\frac{1}{4}$	