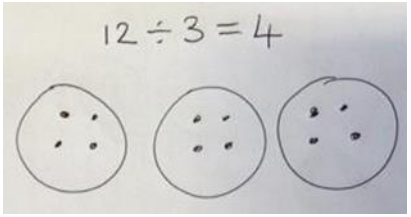
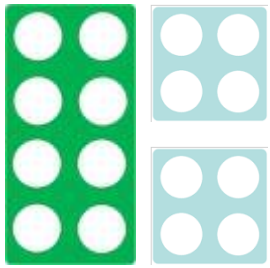
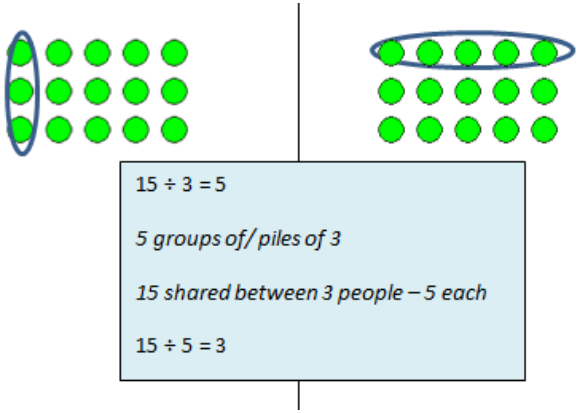
Rushmere Hall Primary School
Taking Pride in Our Learning

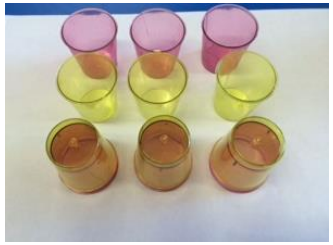
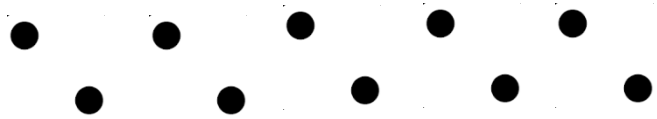
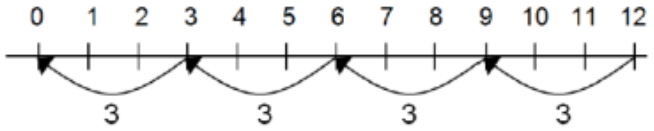
Division

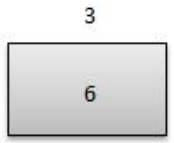
Division should be taught by 'sharing' in the first instance (EYFS). However, children should quickly be moved on to seeing division using 'grouping' adopting the idea that divide means 'has how many' / 'how many are hiding'. Eg. 10 ÷ 2 = (How many 2s are hiding in 10 – 2, 4, 6, 8, 10). The answer is 5. With this method, children can apply their knowledge of counting to solve division.

Objective and Strategies	Concrete	Pictorial	Abstract
Sharing *Children will first experience division through sharing.* Use equipment to model sharing. Ensure children understand that you each have an equal amount. Use the words **equal** and **same.** Display number sentences during teaching so that children associate	Begin by sharing discrete objects such as sweets, cars, small world people, using the following vocabulary: *"One for you, one for me"* *"I have 6 sweets. I share them between me and a friend. How many sweets do we have each?"* *"There are four children with 3 sweets each"* – each means that every child has 3 "Share equally…." "Do we have the same?" "Is this fair? Why not?" "Why is this not equal?"  Children could investigate sharing by:	Children can draw circles to represent the second number, then dots to share the first number. The circles might represent cars, plates, fields, ponds. The first number will represent something which can be distributed equally eg people, biscuits, cows, ducks. 	What is 6 ÷ 2 ?

sharing equally with the division sign. Read number sentence starting with the **dividend** e.g. 6 divided by 2, or 6 shared between 2 Make **mistakes** during your teaching, for example, model sharing 'one for you, one for me' clumsily. Pretend to lose track so that you end up with unequal parts. *"Whoops! What mistake have I made?"*	- Using the Numicon as a base template and trying to find equal parts that will fit exactly on top. How many parts?  **For the first time, children will experience a number in the sentence which does not represent a number of objects – it represents two groups of objects. This will be hard for them.** **Ensure that children understand that division is not commutative ie 5÷2 does not generate the same answer as 2÷5. Use Numicon to model this.**		

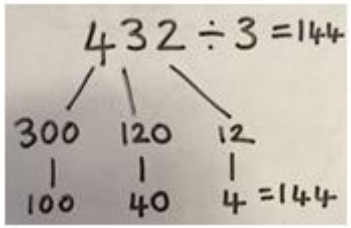
<u>Using Arrays</u> As in the multiplication policy, arrays should be used to teach division and multiplication and the relationship between the two. They can also be used to show that you can visualise arrays for grouping and sharing models. Use the cups to make physical arrays as well as counters and tiles.	Children should be using manipulatives to make arrays according to the number sentence. Eg. 15 ÷ 3 = Children to arrange 15 counters in to 3 rows. How many counters in each row? 	Children should be drawing arrays to show the division number sentence. In the example below, 15 dots are organised in to 3 rows.  	Use an array to write division number sentences.

Grouping Begin teaching the grouping method in EYFS using cups.	Lay out 6 cups. Put the cups in to piles of 2. How many piles of 2 are there? 3. So, 6 divided by 2 is 3. Scribe this.  "One pile of 2, 2 piles of 2, 3 piles of 2. I have 3 piles of 2" In KS1, ask the children *"How many 2's are hiding in 6?"* *"How many 2's are there in 6?"* *"How many groups of 2 are there in 6?"* "12 *can be built* from 4" *"How many 4's do I need to build 12?"* Support this with Numicon and the Numicon track.	Children to draw dots to show how many are hiding in the number. For example: 10 ÷ 2 = How many 2s are hiding in 10? How many 2s in 10? Children to draw sets of 2 dots until they reach 10. How many groups are there?  There are 5 2s hiding in 10. Use a number line to show jumps in groups. The number of jumps equals the number of groups.  	Children to use counting to solve. Eg. 10 ÷ 2 = 2, 4, 6, 8, 10 I have counted 5 times. 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

Halving Children must know that halving is the same as dividing by two – this is the sharing model.	Children to have a mat with two defined areas. Partner 1 makes up a halving story, eg 6 biscuits shared equally between 2. Partner 2 to make this and agree on whether it has been done **equally / fairly** Model this using the foam fractions or fraction walls.	**Informal jottings for finding ½, ¼, 1/8 of a number:** (This is the sharing model) Children should be taught to **partition** to divide by 2, 4, and 8. Finding a quarter is half and half again. Finding an eighth is half and half and half again.	Something divided by 2.
Area *Area is a really good opportunity to practically apply division skills. This links to arrays particularly if you use gridded paper to show the area of shapes.*	Link division to area eg 12 ÷ 3 means you have to make a rectangle with an area of 12. One side of the rectangle must be 3. The answer will be the other side of the rectangle. Having the answer along the top of the rectangle will connect it later with short division. Use Cuisenaire rods and squared paper to support this. 6 ÷ 3 = 2 6 ÷ 2 = 3   3 6	Children to draw a shape and draw the lines in it. If the area is 6cm2 and one of the sides is 3. What is the other side? How many rows of 3 are there? Divide the shape by 3.	Children to draw a shape and draw the lines in it. If the area is 6cm2 and one of the sides is 3. What is the other side? How many rows of 3 are there? Divide the shape by 3. Children should know that this is 6 ÷ 3

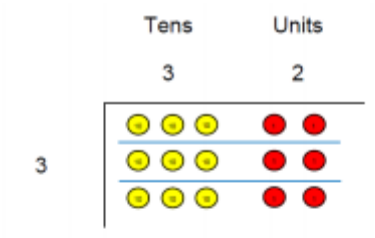
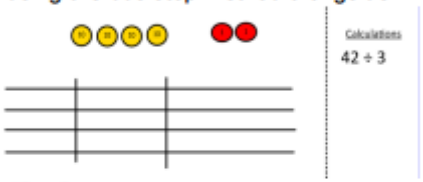
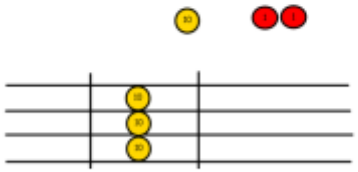
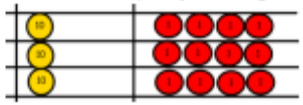
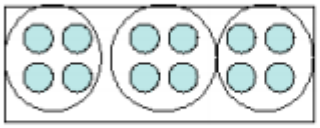
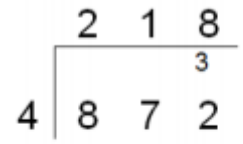
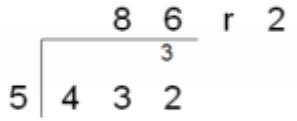
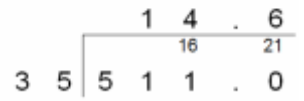
Partitioning

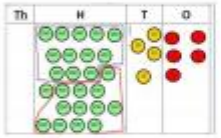
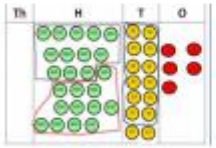
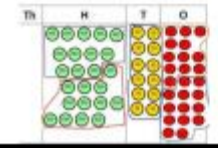
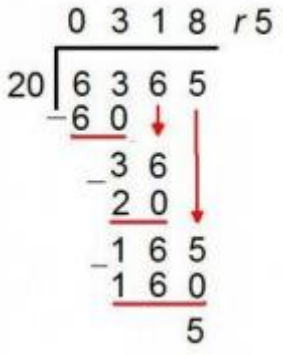
Children should be taught to partition numbers to make them easier to divide. This will involve a lot of talk about the best way to partition the number and all ideas should be accepted. Encourage the children to partition the number into multiples of the divisor, using their times table knowledge to support.

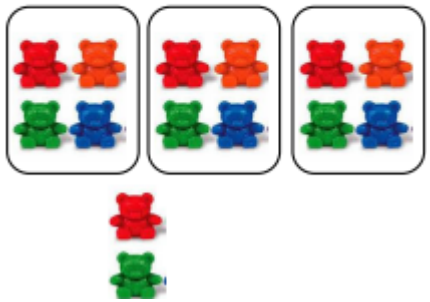
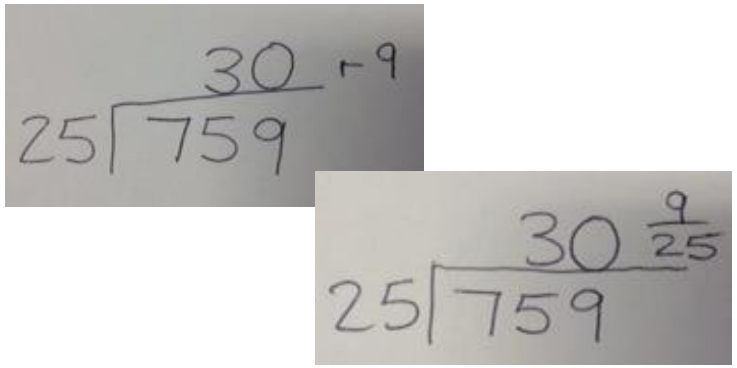
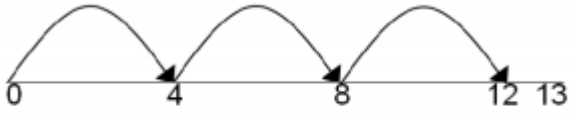
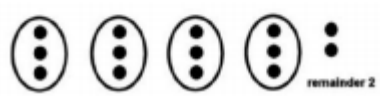


Using Counting and Times tables to Divide

Children must have experience of division during the times table and counting sections of their maths lessons. For example: "How many 25p sweets can I buy for £1.75?" "Well, I know that 4 25's are £1.00, then 25, 50, 75 is 3 more. The answer is 7" or "25, 50, 75, 100, 125, 150, 175…I counted 7 times (on fingers)"
Children need to be taught to use the terms 'factors' and 'multiples'.

Short Division			
	 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.  We exchange this ten for ten ones and then share the ones equally among the groups.  We look how much in 1 group so the answer is 14.	Students 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.  Move onto divisions with a remainder.  Finally move into decimal places to divide the total accurately. 

Long Division			
	 2544 ÷ 12 How many groups of 12 thousands do we have? None Exchange 2 thousand for 20 hundreds.  $12\overline{)2544}$ (0) How many groups of 12 are in 25 hundreds? 2 groups. Circle them. We have grouped 24 hundreds so can take them off and we are left with one.  $12\overline{)2544}$ (02; 24; 1) Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2  $12\overline{)2544}$ (021; 24; 14; 12; 2) Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2  $12\overline{)2544}$ (0212; 24; 14; 12; 24; 24; 0)	Instead of using physical counters, students can draw the counters and circle the groups on a whiteboard or in their books. 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.	 $20\overline{)6365}$ (0318 r5; −60; 36; −20; 165; −160; 5)

Division with a remainder	14 ÷ 3 = Divide objects between groups and see how much is left over  Remainders can be dealt with in a variety of ways, according to the context. Remainders can be presented as a decimal number or as a fraction. Remember when it is a fraction, it is a fraction of the divisor. This can be cancelled to its simplest form.  	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder.  Give the children plenty of opportunities to solve problems where the remainder needs to be rounded up or rounded down. Rounded up: • 45 children were going on a school trip. Each minibus holds 10 children. How many minibuses do we need? • Tables in a café seat 4 people. There are 17 of us. How many tables will we need? Rounded down: • Cakes cost 25p. How many can you buy for £1.70? In a garden centre there are 6 plants for £2.79. You have £20, how many packs of 6 can you buy?	Complete written divisions and show the remainder using r.