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| **Progression in the teaching of Multiplication** | | | |
|  | **CONCRETE** | **PICTORIAL** | **ABSTRACT** |
| Doubling | Using equipment, children understand that doubling is creating an identical number to the one that you started with. Using a variety of equipment they can make two equal groups and know this as doubling.  NSPM_UK_1B_Chapter12_HiRes_p10[1] | Children can draw their own pictures of what doubling looks like.    As the numbers move to more than one digit they are able to use the part part whole model to partition each part before combining to find an answer. | Children can relate doubling to multiplying by 2 and can show this in their facts.  Double 8 is 16, it is the same as 8 X 2 = 16. |
| Counting in multiples | Children can make equal groups of equipment and use these to support them counting in multiples.    05_NSPM_UK_1B_Chapter12_HiRes_p4[1][Image result for equal groups counters](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwi168i22YHWAhXLalAKHd_CA8oQjRwIBw&url=http://smathsmarts.com/understanding-division/&psig=AFQjCNHBpZlXFwillNzx9Yunyps4WQkJSA&ust=1504276662300961) | Children are able to use a number line or draw their own pictorial representations to support them to count in multiples, still understanding the need for equal groups.  05_NSPM_UK_2A_Chapter3_HiRes_p7[1]  05_NSPM_UK_2A_Chapter3_HiRes_p7[1]05_NSPM_UK_1B_Chapter12_HiRes_p4[1] | Children can write sequences of numbers, explaining and following the pattern.  They are able to count aloud in multiples.  2, 4, 6, 8, 10  5, 10, 15, 20, 25, 30  They begin to explain why certain numbers wouldn’t fit the pattern when counting in multiples. |
| Multiplication as repeated addition | Children use a variety of objects to make equal group and know that they need to add together these equal groups to find the total. | Children can draw their own representation. They know that if they add together the equal groups they can find the total. They therefore understand they are adding the same number repeatedly because the groups are equal.  This can be supported by a number line or children make draw their own groups with the addition symbol between them.    [Image result for repeated addition](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjoq_OB3YHWAhVCPFAKHa3HC3QQjRwIBw&url=http://www.abc123kidz.com/multiplication_strategies.html&psig=AFQjCNG0O1lTCLagRI-Mtujplq7uALQzEg&ust=1504277631238396) | Children can create their own number sentence and match this to a representation. |
| Arrays – representing commutative facts | Like with division, children can use the equipment to create an array and discuss what number sentences they can see. They can make sure all their rows and groups are equal.    [Image result for array counters](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=0ahUKEwiK8KiAm_LVAhVSUlAKHT3_ATAQjRwIBw&url=http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/maths/continuum/Pages/identfactor375.aspx&psig=AFQjCNG-CNMH57DMmWc4iL1xhAc8fKhu-g&ust=1503744503586394) | Children can draw their own arrays and explain the multiplication number sentence it shows. They understand that arrays in different orientations give the same total and know the corresponding number sentences.  05_NSPM_UK_2A_Chapter3_HiRes_p24[1]  2 X 8 = 16  8 X 2 = 1605_NSPM_UK_2A_Chapter3_HiRes_p24[1] | Children can use an arrays to write the corresponding number sentences and can recognise how this links to repeated addition. |
| Written multiplication with the expanded method (moving from non-regrouping to regrouping. | Children use the base 10 equipment to make equal groups of a number, they then combine these together (ones, then tens etc) to find the total.  As the total of the ones increased to above 10, children recognise the need to exchange ten ones for one ten.  23 x 4  6_NSPM_UK_3A_Chapter4_HIRES_p9[1]  6_NSPM_UK_3A_Chapter4_HIRES_p9[1] | Children use the part part whole model to recognise the need to partition the number into tens and ones and multiplying each individually before adding together to find the total  6_NSPM_UK_3A_Chapter4_HIRES_p5[1]  05_NSPM_UK_5A_3_HiRes_p28[1]6_NSPM_UK_3A_Chapter4_HIRES_p5[1] | Children begin to organise their work in the column format.  Using the part part whole model, they recognise the need to multiply the ones, then the tens before adding these together. They learn where to record their answers in order to use column addition to add the totals. |
| Written multiplication with the column method | As with the expanded method, children use either the base 10 equipment or the place value counters to create equal groups to multiplying, knowing to start with the ones (unless a decimal)  They continue experiencing calculations that involve renaming.  06_MNP_UK_4A_4_HiRes_V2_p23[1] | Again as with the expanded method, children continue to use the part part whole model to partition numbers as a visual representation of the parts to multiply.  05_NSPM_UK_5A_3_HiRes_p38[1]  116 X 6  6 X 6 = 36  10 X 6 = 60  100 X 6 = 600  600 + 60 + 36 = 969  Alongside the equipment, they also recognise the parts that need multiplying and can write these number sentences | Children learn how to complete the column method of multiplication without the need to use column addition. |