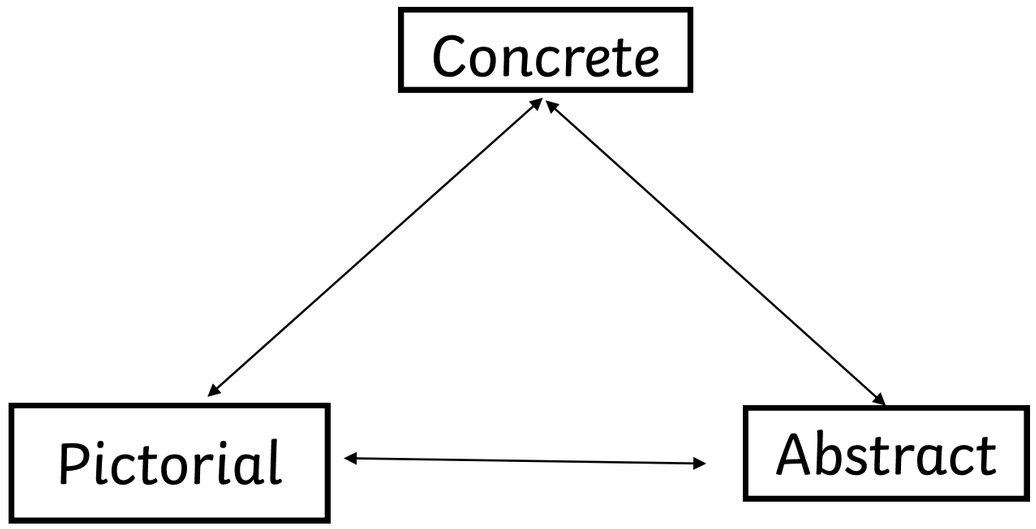
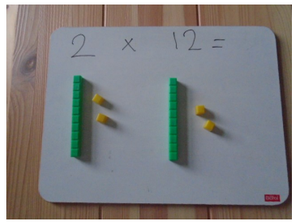
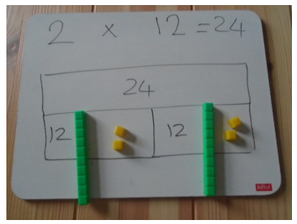
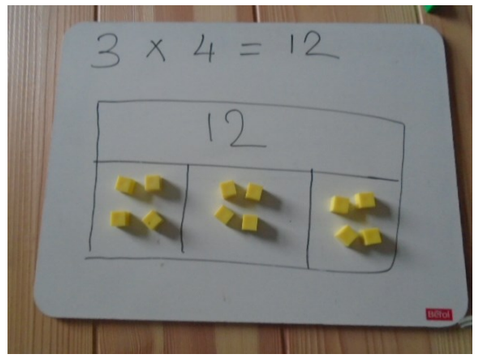
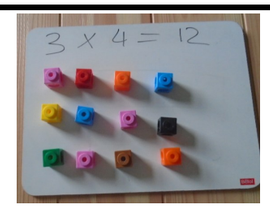
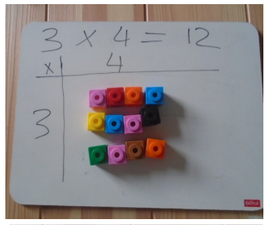
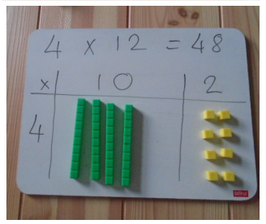
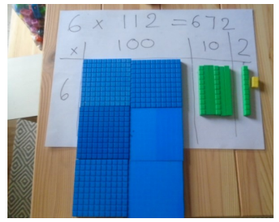
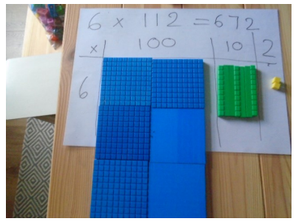
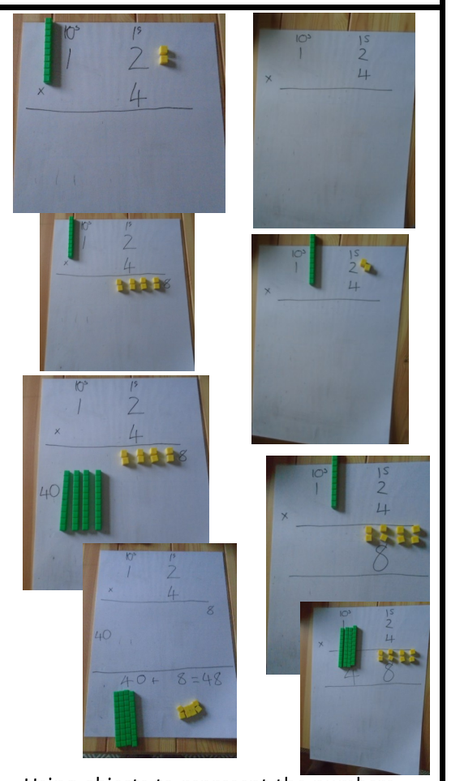
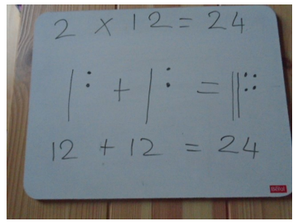
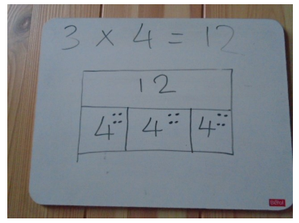
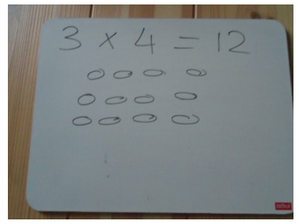
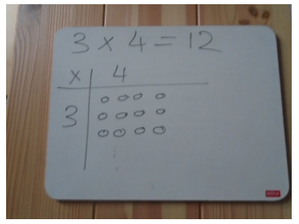
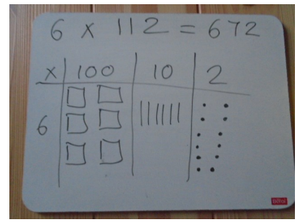
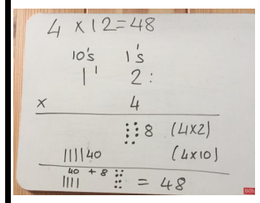
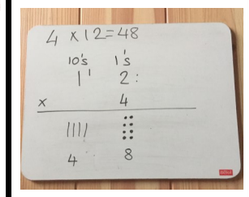
Multiplication



Children to be able to move through towards the stages as they feel ready, concrete resources to always be available to check calculation or reinforce method as needed. Using digits alone should be avoided until the child is secure in the method and able to apply it independently and reason using that skill in problem solving.

Multiplication	Doubling	Repeat Addition	Multiples	Arrays	Grid Method	Formal (partitioned)	Formal (Compact)
Vocabulary	Double, half, two lots of, ones, tens, hundreds, partition, recombine, product, product, times, calculation, bar, parts, equal,	Multiples, equal, product, add, double, half, lots of, groups of, number bonds, same as, calculation, bar, same, parts, commutative,		Array, calculations, multiples, sequence, equal, partition, product, groups, lots of, bar, same	Rows, columns, place value, exchange, grid, multiple, partition, product, add, groups, lots of,	Column, ones, tens, hundreds, partition, place holder, altogether, product, groups of, lots of, add, multiples,	
Concrete	  Introducing the idea of double as two lots of an equal amount, children use objects to create two groups of equal amounts. Larger numbers to be partitioned then doubled individually, always starting with the ones, before recombining. Using a bar this is shown with two equal parts (linking to fractions). This should be increasingly done mentally.	 Building on doubling, children practise using objects to find more “lots of” equal amounts. Using the bar, the number of parts is first number in the calculation, the second number in the calculation is the amount in each part. As children become more secure, they become able to choose which number to be the parts and which to be the amounts. Starting by adding the amounts, using number bonds and doubles, then beginning to count in the multiples. Once secure this should be increasingly done mentally.	   Using objects, children use squared paper to create an array, for example 3 lots of 4. Children then count in multiples to calculate the product. Calculation to be displayed alongside objects. As they become more secure, this can be done on the grid method template sheet.	  Using objects to represent the tens and ones of each number on a grid method template. Calculation to be displayed alongside objects and for larger numbers, as children become more secure they should move on to jottings.	 Using objects to represent the numbers, children use the formal method template to calculate the product. Children should use their knowledge of multiples and should move onto jottings, especially with larger numbers. Calculation and digits to be displayed alongside objects.	
	Possible Resources cubes, dienes, topic related objects, part-whole diagram, counters,	Possible Resources cubes, dienes, topic related objects, part-whole diagram, counting stick,		Possible Resources counters, dienes, topic related objects, squared paper, cubes, grid method template,	Possible Resources pre-prepared grid templates, counters, dienes, topic related objects, squared paper, cubes,	Possible Resources multiplication template, dienes, counters, topic related objects.	
	How it would look in books Photograph	How it would look in books Photograph		How it would look in books Photograph	How it would look in books Photograph	How it would look in books Photograph	

Multiplication	Doubling	Repeat Addition	Multiples	Arrays	Grid Method	Formal (partitioned)	Formal (Compact)
Vocabulary	Double, half, two lots of, ones, tens, hundreds, partition, recombine, product, product, times, calculation, bar, parts, equal,	Multiples, equal, product, add, double, half, lots of, groups of, number bonds, same as, calculation, bar, same, parts, commutative,		Array, calculations, multiples, sequence, equal, partition, product, groups, lots of, bar, same	Rows, columns, place value, exchange, grid, multiple, partition, product, add, groups, lots of,	Column, ones, tens, hundreds, partition, place holder, altogether, product, groups of, lots of, add, multiples,	
Pictorial	 Using the bar to show two equal groups. Jottings or pictures of objects replace the objects themselves. Larger numbers to be partitioned, working from the smallest value to the largest, before adding them together. This is **increasingly a mental skill**, especially with larger numbers where a jotting start to become impractical. Digits to be used as well as jottings or pictures. Calculation is written next to the bar.	 Building on doubling, children practise using jottings or pictures to find more "lots of" equal amounts. Using the bar, children will increasing counting in multiples. This is an increasing mental skill, where numbers can be partitioned if needed. This should be **increasingly done mentally**, especially with larger numbers where jottings are impractical. Digits to be used as well as jottings. Calculation is written next to the bar.		  Using jottings or pictures, children use squared paper or part-whole diagrams to create an array. Calculation to be displayed alongside. As they become more secure, this can be set out in the form of the grid method, either prepared or drawn by themselves. With larger numbers, jottings representing 10s or 100s should be used. Calculation is written near the array.	 Using grid templates, jottings or pictures can be used to represent hundreds, tens and ones. By **using known mental facts**, reliance on jottings should decrease as children become more secure. Digits to be used as well as jottings. Calculation to be near to the grid.	 Using multiplication template, children use jottings or paper dienes to accompany the digits. Known multiples should be used to calculate the answer, for the answer to be written in number form below the first horizontal line. Exchange should be shown 'on the doorstep' below the second horizontal line by another jotting or paper dienes.	
	Possible Resources green and yellow paper to represent dienes, pictures of topic objects, explanation of 'fish, chips, peas' for jottings, part-whole diagrams	Possible Resources pre-prepared part-whole diagrams, green and yellow paper to represent dienes, pictures of topic objects, explanation of 'fish, chips, peas' for jottings,		Possible Resources squared paper, part-whole diagram, grid method templates, green and yellow paper to represent dienes, pictures of topic objects, fish, chips and peas' jottings	Possible Resources pre-prepared grid templates, counters, dienes, topic related objects, squared paper, cubes,	Possible Resources multiplication template, dienes, counters, topic related objects.	
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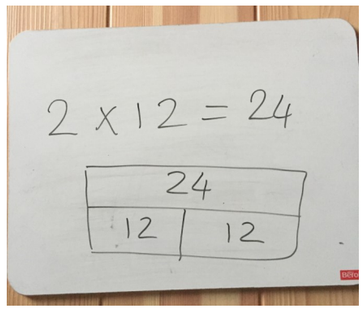
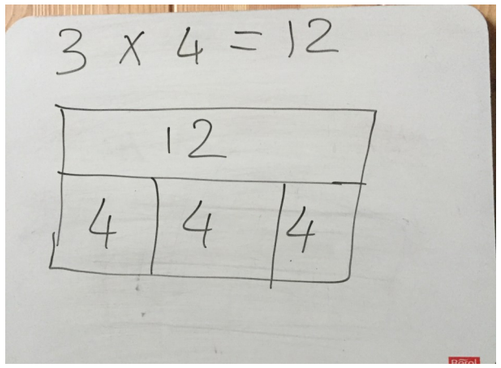
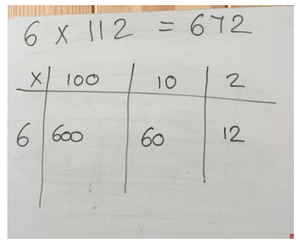
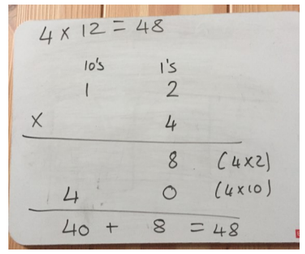
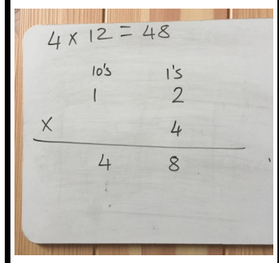
Abstract				N/A see grid method			
	Increasingly a mental skill, children should be able to quickly double numbers, including using mental partitioning or using known facts. For example, when doubling 140, children will be able to explain that they can either double 100 and double 40 or double 14 and make it 10 times bigger. Jottings can be used to aid memory, although these will be increasingly in number form.	Increasingly a mental skill, children will have developed a quick recall of multiples. Children can then use these to solve problems and work out unknown facts. Where children have gaps in their multiples knowledge they should use repeat addition. For example, using 6 x 7 then add 7 to work out 7 x 7. Squared numbers should be identified and quickly recalled. Jottings can be used to aid memory, although these will be increasingly in number form.			Using grid templates or self drawn grid, children use known facts to multiply increasingly larger numbers. Objects and jottings are replaced with numbers, although, jottings can be used to support understanding if needed.	Using multiplication template, jottings or objects are replaced with digits. Known multiples should be used to calculate the answer, for the answer to be written in number form below the first horizontal line. Exchange should be shown 'on the doorstep' below the second horizontal line by another jotting or paper dienes.	
	Possible Resources whiteboards, pens, jotters, pencils	Possible Resources whiteboards, pens, jotters, pencils,			Possible Resources fish, chips and peas jottings, grid template, self drawn grids,	Possible Resources multiplication template, whiteboards, pens,	
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