Milestones for when children are expected to attain declarative knowledge

Nursery – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that I can count in units of initially to three and then five. I know that I can compare groups of one and not one (lots). I know that I can count groups of 2 using rhyme and songs to help me. I know that when comparing groups that are the same this is doubling.	I know how to use grouping to help me understand sharing. I know how to share using objects. I know how to use rhyme and song to help me with my sharing.	I know when exploring groups that role play, and rhymes can help me with my sharing.	Groups, lots, count, compare, sharing, doubling, halving, number patterns, smaller, fewer,	There are _____ in a group. There are one in that group and lots in the other group. I can see there are _____ in the group.

Milestones for when children are expected to attain declarative knowledge

Reception – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that doubles are when two groups have an equal number. I know that I can find doubles up to 10. I know that doubling is when there are two equal groups. I know that I can explore halving through play. I know that I can count in 2s to 10.	I know how to use my counting skills to see if groups are equal. I know how to use equipment, such as ten frames to check for doubles. I know how to share fairly. I know how explore doubling through games and my environment. I know how to find half of a quantity. I know how to use pairs to help me when counting in twos.	I know when two groups have the same amount, they are equal. I know when exploring doubles and halves, that looking for patterns can help me.	Whole, altogether, groups, equal, half, part, ones, ten, less, more, group, share, equal, equals, is equal to, groups, equal groups, divide, share, shared equally	I can see group 1 has ____ and group 2 has _____ so they are _____.

Milestones for when children are expected to attain declarative knowledge

Year 1 – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that doubles are two groups of the same number. I know that I can find doubles up to 20. I know that equal groups can be represented as an array. I know that groups of 2 are even, groups of 5 end in 5 or 0, groups of 10 end in 0. I know that repeated addition can help me with multiplication. I know that multiplication is commutative.	I know how to solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations, and arrays with the support of the teacher which strategies to use and why. I know how to multiply and divide with money using the value of the coin. I know how to use grouping to help me understand sharing equally. I know how counting in 2s, 5s and 10s can help me find the total of equal groups.	I know when solving written equations which strategy to use and why. I know when solving equations which resources can help me and why.	repeated addition array row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of, left over	There are ___ equal groups. There are ___ in each group. The groups are equal/ unequal because _____ There are ___ groups of ____/ There are ____ altogether. I know that 3 equal groups of ___ is the same as ___ + ___ + ____.

Milestones for when children are expected to attain declarative knowledge

Year 2 – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that multiplication is commutative. I know that I can use the operations of multiplication (repeated addition) and division (equal groups of).to help me solve calculations. I know that I can recall the 2s, 5s and 10s times tables. I know that I can recall the odds and evens in the times tables for 2,5 and 10s. I know that multiplication is inverse to division I know that multiplication is linked to repeated addition. I know that I can recall multiplication and division facts for 2, 5 and 10 I know that I can use arrays to represent multiplication and division facts.	I know how to recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers I know how to calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs I know how to show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	I know when solving written equations which strategy to use and why. I know when solving missing number problems which strategy to use and why.	lots of, groups of ×, times, multiply, multiplied by multiple of once, twice, three times… ten times… times as (big, long, wide… and so on) repeated addition array row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of ÷, divide, divided by, divided into left, left over, inverse	There are ___ equal groups. There are ___ in each group. The groups are equal/ unequal because _____ There are ___ groups of ____/ There are ____ altogether. I know that 3 equal groups of ___ is the same as ___ + ___ + ____. There are three equal groups with ___ in each group. ___ + __ + ___ = ____ . ___ x ____ = _____ ____ multiplied by ___ is equal to ___ In this array, I can see __ x ___ and ___ x ____ There are ____ altogether. I have put them into equal groups of ____. There are ___ groups. ___

Milestones for when children are expected to attain declarative knowledge

Year 3 – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that commutative law means that the order of operation will not change the result. I know that the associative law of multiplication means that rearranging the order of operations will not change the results. I know that I can partition numbers to help me when multiplying. I know that I can rearrange dividends into multiples of the divisor. I know that I can recall the 2, 3, 4- and 8-times tables and can discuss the patterns with doubling, odds and evens. I know that I can find corresponding division facts using my knowledge of inverse. I know that I can partition numbers when multiplying in a grid/short method. I know that I can divide and record remainders. I know that I can find tables facts for 2,3,4,5,8,10s. Understanding how to derive corresponding divisions.	I know how to recall and use multiplication and division for the 3,4- and 8-times tables. I know how partitioning into friendlier numbers can help me when multiplying. I know how using a place value chart with regrouping can help me. I know how to write and calculate mathematical statements for multiplication and division using the multiplication facts that they know including TU x U, using mental and then progressing to formal written methods. I know how to multiply/divide two-digit numbers by one-digit numbers using expanded or formal written methods of short multiplication and division.	I know when finding facts how the law of commutativity can help me. I know when multiplying which resources can help me and why. I know when solving problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects, which strategy is the most efficient to use.	lots of, groups of ×, times, multiply, multiplication, multiplied by multiple of, product once, twice, three times… ten times… times as (big, long, wide… and so on) repeated addition array row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of ÷, divide, division, divided by, divided into left, left over, remainder commutative, inverse.	There are _____equal groups with _____in each group. There are_____ altogether. The groups are equal because _____. There are _____ lots of _____, there are _____ in total. I know the law of commutativity, so I know that ____ lots of _____ = ____ lots of _____ I know that ____ is a multiple of 5/ 10 because _____ _____ has been shared equally into _____ groups Double ____is _____ and double ___ is _____ , so 4 lots _____ of _____is _____ There are 4 groups of ____ in _____• × 4 _____=_____ × 4 + _____× 4 There are 8 groups of ____in ____ _____ × 8 = _____× 8 +_____ × 8

Milestones for when children are expected to attain declarative knowledge

I know that I can recall multiplication and division facts for 3s, 4s and 8 times tables				

Milestones for when children are expected to attain declarative knowledge

Year 4 – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that I can recall multiplication and division facts for multiplication tables up to 12 × 12. I know thawhen solving problems with sharing, if it cannot be done equally it will result in a remainder I know that a factor pair are two whole numbers multiplied together to get a product. I know that I can use the formal written method of short multiplication and short division with exact answers. I know that 10 times the size is the same as multiplying by 10.	I know how to apply table facts for recall of multiplication and division facts when calculating. I know how to multiply/divide two-digit and three-digit numbers by one-digit numbers using expanded or formal written methods of short multiplication and division. I know how to use my times table knowledge to help me with finding multiples of numbers. I know how to use place value, known and derived I know that I can use place value, known and derived facts to multiply and divide mentally, including multiplying and dividing by 0 and 1; dividing by 1; multiplying together three numbers. I know how to find the effect of dividing a one- or two- digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths. I know how to recognise and use factor pairs and commutativity in mental calculations. I know that I can multiply and divide two-digit and three-digit numbers by a one- digit number using a formal layout.	I know when solving problems with multiplication and division how resources can help me. I know when solving problems involving multiplying and adding, including integer scaling problems and harder correspondence problems such as n objects are connected to m objects which strategy to use. I know when solving integer scaling problems and harder correspondence problems which strategy to use.	lots of, groups of times, multiply, multiplication, multiplied by multiple of, product once, twice, three times… ten times… times as (big, long, wide… and so on) repeated addition array row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse	The next multiple of ___ is ____ The multiple of ___ before ___ is ____ I know ____ is a multiple of ___ because _____ ____ x 6 = double ____ x 3 Multiplying by ___ is the same as multiplying by ___ twice ___ lots of ___ is equal to ___ ___ x 10 = _____, so ____ x 9 = ___ - ____ = _____ --- has ___ factors altogether The factor pairs of __ are ___ and ___ ___ is one tenth the size of ____ is one hundredth the size of

Milestones for when children are expected to attain declarative knowledge

Year 5 – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that I can find factor pairs. I know that I understand the definition of prime numbers and composite numbers. I know that I understand the terms factors, multiple and prime, square and cube numbers. I know that I can explain the definition of square and cube numbers and use the correct notation.	I know how to perform long multiplication. I know how to perform short division including remainders. I know how to multiply and divide numbers mentally using known facts I know how to use efficient mental methods for multiplication and division. I know how to use efficient written algorithms for long multiplication and short division. I know how to identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers I know how to divide numbers up to four- digits by a one-digit number using the formal written method of short division and interpret remainders appropriately according to context I know how to tell whether a number up to 100 is a prime number and recall prime numbers up to 19 I can recognise and use square numbers and cube numbers and their notation.	I know when to use which method for multiplication and division I know when finding multiples of a given number to work systematically. I know when solving problems using multiplication and division how to use my knowledge of factors and multiples, squares and cubes to help me. I know when solving problems involving multiplication and division, including scaling by simple fractions and problems involving simple ratios which strategy to use.	lots of, groups of times, multiply, multiplication, multiplied by multiple of, product once, twice, three times… ten times… times as (big, long, wide… and so on) repeated addition array row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse factor, multiple	The first multiple of a number is always _____ ___ is a factor of ___ because ___ is in the ___ times tables. To square a number you multiply the number by _____ The first common multiple of ___ and ____ is _____ ___ is a prime factor because it has exactly ___ factors. ___ is a multiple of ___ so ___ is a factor of ____. The cube of a number is the result of multiplying the number by ___ and then by ___ again. The product in my area model are ___, ____, ___ and ____, so the total product is ___ + ____ + ____ + ____ = _____ First, I multiply ___ by ___ ones. Then I multiply __ by ___ tens. Finally, I add together ___ and ____. To calculate ___ x ___, I can do ___ x ___ x ____ The most efficient strategy to calculate ___ x ____ is ___

Milestones for when children are expected to attain declarative knowledge

Year 6 – Multiplication and division				
Declarative knowledge	Procedural knowledge	Conditional knowledge	Vocabulary	Stem sentences
I know that I understand efficient mental methods applying knowledge of properties of number. I know that I can use efficient written algorithms for long/ short multiplication and long/ short division. I know that I can recall rules when using mental calculations with increasingly large numbers and more complex calculations. I know that I can recall the rules of BIDMAS. I know that I understand the compact algorithms for all four operations. I know that I can identify common factors, common multiples and prime numbers.	I know how to use the compact algorithms for all four operations. I know how to use written division methods in cases where the answer has up to 2 decimal places I know how to use long algorithms for long multiplication and division. I know how to multiply one-digit numbers with up to 2 decimal places by whole numbers I know how to use my knowledge of the order of operations to carry out calculations involving the 4 operations I know how to use the rules of divisibility to help me when dividing. I know how to multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication I know how to divide numbers up to 4 digits by a two digit whole number using the formal written method of long division and interpret remainders as whole number remainders, fractions or by rounding, as appropriate for the context.	I know when it is appropriate to perform mental calculations, including with mixed operations and large numbers I know when solving problems involving multiplication and division which requires answers to be rounded to specified degrees of accuracy which method is the most efficient. I know when choosing calculations how to work most efficiently. I know when to use inverse to check my calculations.	lots of, groups of times, multiply, multiplication, multiplied by multiple of, product once, twice, three times… ten times… times as (big, long, wide… and so on) repeated addition array, row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse	___ is a factor of all numbers, The largest factor of a number is always ____ ___ is a factor of ___ because ___ is in the ____ times-table. A number is divisible by ___ if its ones digit is ____ If the sum of the digits is divisible by ____, then the number is divisible by _____ I know that ____ is a square/ cube number because ___ To multiply by a 2-digit number, first multiply by the ___ then multiply the ___ and then find the ____.

Milestones for when children are expected to attain declarative knowledge

	I know how to perform mental calculations, including with mixed operations and large numbers.			