Multiplication	
Year 5	**Year 6**
Basic to subject specific (Beck's Tiers):  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 factor, multiple, prime, composite, cube numbers, prime numbers, square numbers common factors, prime number, prime factors, composite numbers **Instructional vocabulary:** carry on, continue, repeat what comes next? predict describe the pattern, describe the rule, find, find all, find different investigate **Generalisation** Relating arrays to an understanding of square numbers and making cubes to show cube numbers. Understanding that the use of scaling by multiples of 10 can be used to convert between units of measure (e.g. metres to kilometres means to times by 1000) **Some Key Questions** What do you notice? What's the same? What's different? Can you convince me? How do you know? How do you know this is a prime number?	**Basic to subject specific (Beck's Tiers):**  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, factor, multiple, prime, composite, common factor **Instructional vocabulary:** carry on, continue, repeat what comes next? predict describe the pattern, describe the rule find, find all, find different investigate **Generalisations** Order of operations: brackets first, then multiplication and division (left to right) before addition and subtraction (left to right). Children could learn an acrostic such as PEMDAS, or could be encouraged to design their own ways of remembering. Understanding the use of multiplication to support conversions between units of measurement. **Some Key Questions** What do you notice? What's the same? What's different? Can you convince me? How do you know?
NC 2014: Multiply numbers up to 4 digits by a 1 or 2 digit number using a formal written method, including long multiplication for 2 digit numbers Solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates	**NC2014:** Multiply multi-digit numbers up to 4 digits by a 2 digit whole number using the formal written method of long multiplication. Solve problems involving addition, subtraction, multiplication and division.

Mental Strategies

Children should continue to count regularly, on and back, now including steps of powers of 10.

Multiply by 10, 100, 1000, including decimals (Moving Digits ITP)

The number line should continue to be used as an important image to support thinking, and the use of informal jottings should be encouraged.

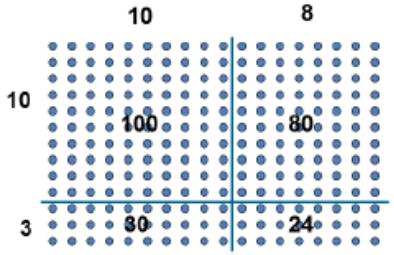
They should be encouraged to choose from a range of strategies to solve problems mentally:

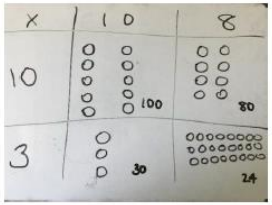
- Partitioning using x10, x20 etc
- Doubling to solve x2, x4, x8
- Recall of times tables
- Use of commutativity of multiplication

If children know the times table facts to 12 x 12. Can they use this to recite other times tables (e.g. the 13 times tables or the 24 times table)

ThHTU x TU and HTU x TU and including decimals.

Concrete, pictorial abstract:

Expanded method	Show the link with arrays to first introduce the expanded method. 

Pictorial	Abstract
 	Start with long multiplication, reminding the children about lining up their numbers clearly in columns. 18 x 13 24 (3 x 8) 30 (3 x 10)) 80 (10 x 8) 100 (10 x 10) 234

TU x TU

78
x 42
16 (2 x 8)

Mental Strategies

Consolidate previous years.

Children should experiment with order of operations, investigating the effect of positioning the brackets in different places, e.g. 20 – 5 x 3 = 5; (20 – 5) x 3 = 45

They should be encouraged to choose from a range of strategies to solve problems mentally:

- Partitioning using x10, x20 etc
- Doubling to solve x2, x4, x8
- Recall of times tables
- Use of commutativity of multiplication

If children know the times table facts to 12 x 12. Can they use this to recite other times tables (e.g. the 13 times tables or the 24 times table)

Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

18
x 13
24 (3 x 8)
30 (3 x 10))
80 (10 x 8)
100 (10 x 10)
234

This moves to the more compact method.

1342
x 18
13420
10736
24156

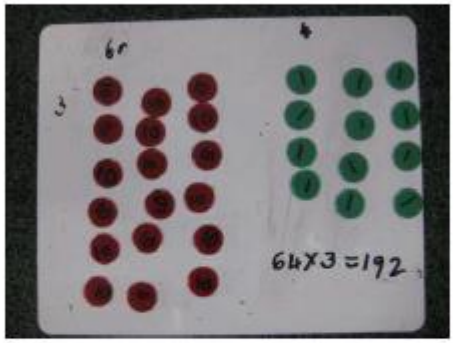
140 (2 x 70)
320 (40 x 8)
+2800 (40 x 70)
3276

Compact (long)

78
x42
156
1
+3120
3276

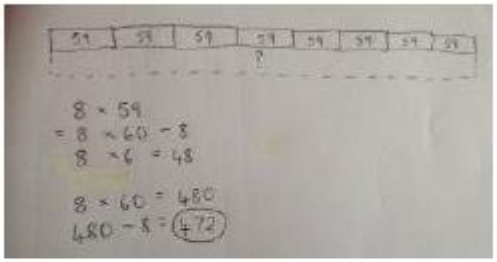
Compact method

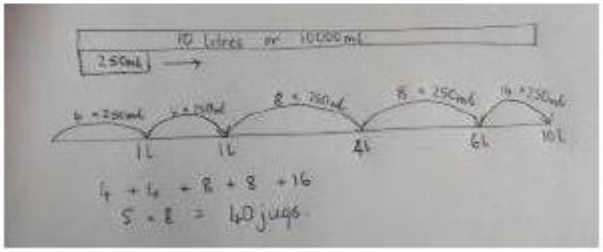
Children can continue to be supported by place value counters at the stage of multiplication.



It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.





Known facts	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Recall prime numbers up to 19 Recognise and use square and cube numbers and the notation for squared (^{2}) and cubed (^{3})		Identify common factors, common multiples and prime numbers	
Essential knowledge	4x and 8x tables	100, 1000 times bigger	Multiplication facts up to 12 x 12	Partition to multiply mentally
	3x, 6x and 12x tables; 3x and 9x tables	10, 100, 1000 times smaller	Apply place value to derive multiplication facts, e.g. 3 x 4 = 12 so 3 x 0.4 = 1.2	Double larger numbers and decimals

	11x and 7x tables	Double larger numbers and decimals		