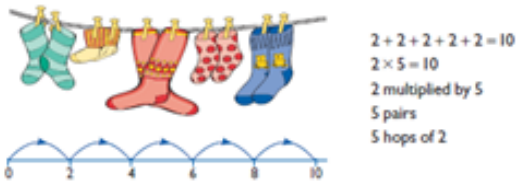
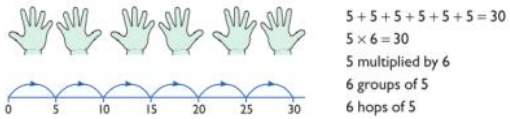
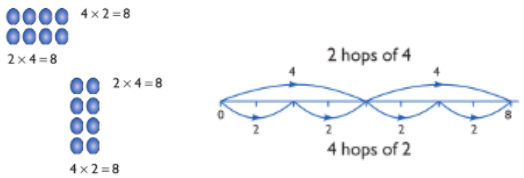
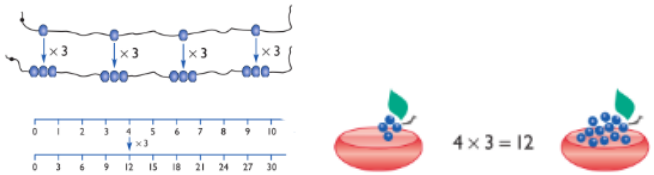
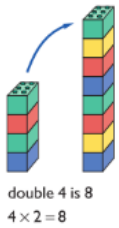
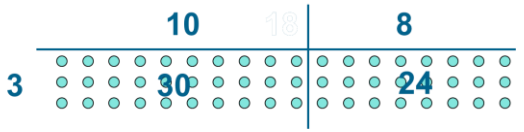
Multiplication at Ravensbury

Year 1	Year 2	Year 3
Understand multiplication is related to doubling and combing groups of the same size (repeated addition) Washing line, and other practical resources for counting. Concrete objects. Numicon; bundles of straws, bead strings   Problem solving with concrete objects (including money and measures Use Cuisenaire rods/Dienes rods and bar method to develop the vocabulary relating to 'times' – Pick up five, 4 times Use arrays to understand multiplication can be done in any order (commutative)  **Mental Strategies** Children should experience regular counting on and back	Expressing multiplication as a number sentence using x Using understanding of the inverse and practical resources to solve missing number problems. 7 x 2 = □ □ = 2 x 7 7 x □ = 14 14 = □ x 7 □ x 2 = 14 14 = 2 x □ □ x ◯ = 14 14 = □ x ◯ Develop understanding of multiplication using array and number lines (see Year 1). Include multiplications not in the 2, 5 or 10 times tables. Begin to develop understanding of multiplication as scaling (3 times bigger/taller)  Doubling numbers up to 10 + 10 Link with understanding scaling Using known doubles to work out double 2d numbers (double 15 = double 10 + double 5)  	Continue with a range of equations as in Year 2 but with appropriate numbers. **Written methods (progressing to 2d x 1d)** Developing written methods using understanding of visual images  Developing written methods using understanding of visual images.  Which then develop onto the grid method. Give children opportunities for children to explore this and deepen understanding using Dienes apparatus and place value counters **Mental methods** Doubling 2 digit numbers using partitioning Demonstrating multiplication on a number line – jumping in larger groups of amounts 13 x 4 = 10 groups 4 = 3 groups of 4 **Mental Strategies** Children should continue to count regularly, on and back; now including multiples of 4, 8, 50, and 100, and steps of 1/10. The number line should continue to be used as an important image to support thinking, and the use of informal jottings and drawings to solve problems should be

from different numbers in 1s and in multiples of 2, 5 and 10.
Children should memorise and reason with numbers in 2, 5 and 10 times tables
They should see ways to represent odd and even numbers. This will help them to understand the pattern in numbers.

Children should begin to understand multiplication as scaling in terms of double and half. (e.g. that tower of cubes is double the height of the other tower)

Understand 6 counters can be arranged as 3+3 or 2+2+2

Understand that when counting in twos, the numbers are always even.

Vocabulary
Ones, groups, lots of, doubling
repeated addition
groups of, lots of, times, columns, rows
longer, bigger, higher etc
times as (big, long, wide …etc)

Questions for Mastery and Reasoning
Why is an even number an even number?
What do you notice?
What's the same? What's different?
Can you convince me?
How do you know?

Towards written methods
Use jottings to develop an understanding of doubling two digit numbers.

16
10 6
x2 x2
20 12

Mental Strategies
Children should count regularly, on and back, in steps of 2, 3, 5 and 10.
Number lines should continue to be an important image to support thinking, for example

Children should practice times table facts
2 x 1 =
2 x 2 =
2 x 3 =

Use a clock face to support understanding of counting in 5s.
Use money to support counting in 2s, 5s, 10s, 20s, 50s

Repeated addition can be shown mentally on a number line

Inverse relationship between multiplication and division.

Use an array to explore how numbers can be organised into groups.

Vocabulary
multiple, multiplication array, multiplication tables / facts
groups of, lots of, times, columns, rows

Questions for Mastery and Reasoning
What do you notice?
What's the same? What's different?
Can you convince me?
How do you know?

encouraged.

Children should practice times table facts
3 x 1 =
3 x 2 =
3 x 3 =

Connecting x2, x4 and x8 through multiplication facts

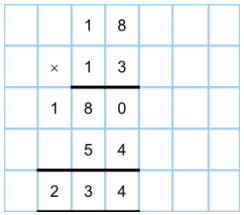
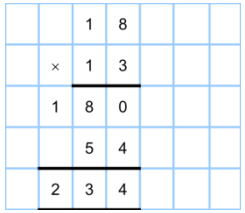
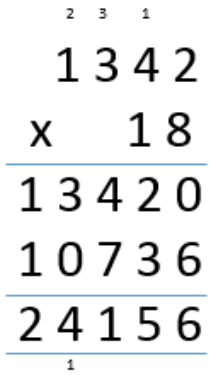
Comparing times tables with the same times tables, which is ten times bigger. If 4 x 3 = 12, then we know 4 x 30 = 120. Use place value counters to demonstrate this.

When they know multiplication facts up to x12, do they know what x13 is? (i.e. can they use 4x12 to work out 4x13 and 4x14 and beyond?)

Vocabulary
partition
grid method
inverse

Questions for Mastery and Reasoning
What do you notice?
What's the same? What's different?
Can you convince me?
How do you know?

Multiplication at Ravensbury

Year 4	Year 5	Year 6
Continue with a range of equations but with appropriate numbers to Year 4 POS. Also include equations with missing digits, which rely on known fact knowledge. □2 x 5 = 160 **Written methods (progressing to 3d x 2d)** Children to embed and deepen their understanding of the long multiplication method to multiply up 2d x 2d. Ensure this is still linked back to their understanding of grid, arrays and place value counters.  **Mental methods** Counting in multiples of 6, 7, 9, 25 and 1000, and steps of 1/100. Solving practical problems where children need to scale up. Relate to known number facts. (e.g. how tall would a 25cm sunflower be if it grew 6 times taller?) Children should continue to count regularly, on and back, now including multiples of 6, 7, 9, 25 and 1000, and steps of 1/100. Become fluent and confident to recall all tables to x 12 Use the context of a week and a calendar to support the 7 times table (e.g. how many days in 5 weeks?) Use of finger strategy for 9 times table. Multiply 3 numbers together The number line should continue to be used as an	Continue with a range of equations as in Year 4 but with appropriate numbers. Also include equations with missing digits **Written methods (progressing to 4d x 2d)** Long multiplication using place value counters Children to explore how the grid method supports an understanding of long multiplication (for 2d x 2d)  **Mental methods** X by 10, 100, 1000 using moving digits ITP Use practical resources and jottings to explore equivalent statements (e.g. 4 x 35 = 2 x 2 x 35) Recall of prime numbers up 19 and identify prime numbers up to 100 (with reasoning) Solving practical problems where children need to scale up. Relate to known number facts. Identify factor pairs for numbers 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.	*Consolidate previous years.* **Written methods** Identifying common factors and multiples of given numbers Solving practical problems where children need to scale up. Relate to known number facts. Continue to refine and deepen understanding of written methods including fluency for using long multiplication  **Mental methods** 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) Order of operations: brackets first, then multiplication and division (left to right) before addition and subtraction (left

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: - Partitioning using x10, x20 etc. - Doubling to solve x2, x4, x8 - Recall of times tables - Use of commutativity of multiplication - Children given the opportunity to investigate numbers multiplied by 1 and 0. When they know multiplication facts up to x12, do they know what x13 is? (i.e. can they use 4x12 to work out 4x13 and 4x14 and beyond?) **Vocabulary** Factor **Questions for Mastery and Reasoning** What do you notice? What's the same? What's different? Can you convince me? How do you know?	- 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) 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) **Vocabulary** cube numbers prime numbers square numbers common factors prime number, prime factors composite numbers **Questions for Mastery and Reasoning** 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?	to right). Understanding the use of multiplication to support conversions between units of measurement. **Vocabulary** common factor *See previous years* **Questions for Mastery and Reasoning** What do you notice? What's the same? What's different? Can you convince me? How do you know?