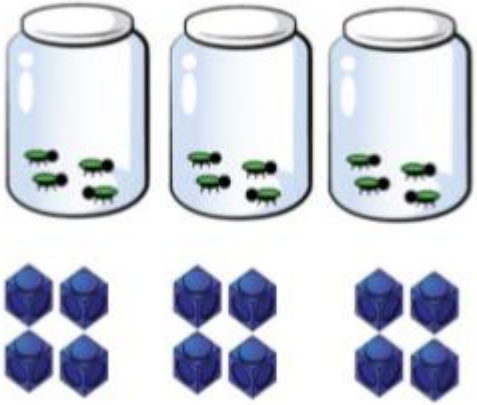
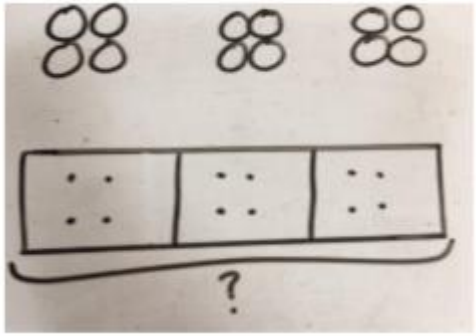
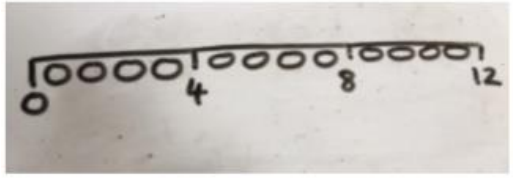
Sunnyside Primary Academy Multiplication Calculation Policy

Use NCETM Sentence Stems to support
https://nottinghamacademy.sharepoint.com/:b:/r/sites/spa_primary/Shared%20Documents/a4.%20CURRICULUM%20DOCUMENTS/Maths/Planning%20and%20Resources/NCETM%20Sentence%20Stems%20Multiplication%20and%20Division.pdf?csf=1&web=1&e=KOCkdY

Skills	Concrete	Pictorial	Abstract
1.Repeated grouping/ repeated addition **grouping, equal groups, group, part, equal, repeated addition How many times?**	3 × 4 4 + 4 + 4 There are 3 equal groups, with 4 in each group. 	 Children to represent the practical resources in a picture and use a bar model. *Sentencee stem: There 3 groups. There are 4 in each group. Altogether, there are 12 circles/ dots.*	3 x 4 = 12 4 + 4 + 4 = 12 *We are adding 4 three times.*
2.Number lines to show repeated groups **groups, groups of, lots of, multiply, multiplied by, times, steps, equal**	3 x 4 = 12  *We can represent the groups of 4 using the Numicon shape 4. There are three 4s. Children count in 4s or lay 10 and 2 Numicon pieces over the top to find the total* Cuisenaire rods could also be used.	Abstract number line representing the three groups of four. 	Abstract number line showing three jumps of four. 3 x 4 = 12 

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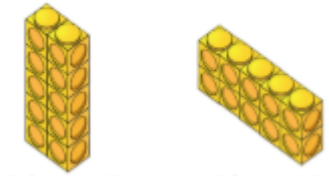
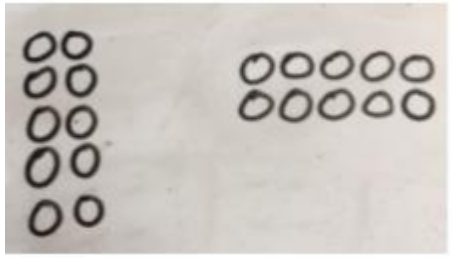
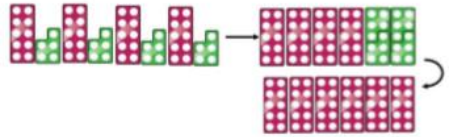
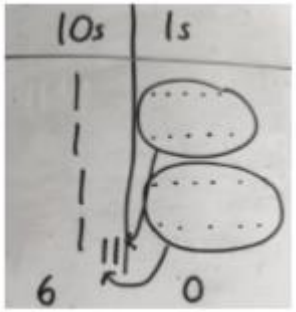
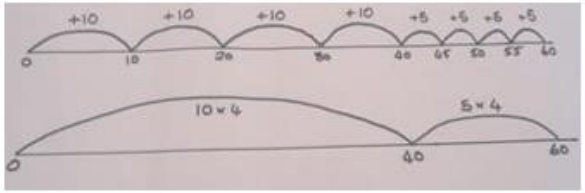
3.Use arrays to illustrate commutativity **array, lots of, groups of, commutative, repeated addition, row, column**	Counters, objects, Numicon pegs and other objects can be used. $2 \times 5 = 5 \times 2$  2 lots of 5 5 lots of 2	Children to represent arrays pictorially.  *What's the same? What's different?*	Children to be able to use an array to write a range of cclculations, e.g: $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$
4.Partition to multiply **partition, tens, ones, value, groups of, lots of, multiply, multiplied by, times, derive** **product, scale up** **commutativity associativity**	Partition to multiply using Numicon, Base 10 or Cuisenaire rods. 4 x 15 	Children to represent the manipulatives pictorially.  1. No exchnage. 2. Exchange ones.	Children should be encouraged to show their process: 4 x 15 10 5 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60 A number line might be used alongside. Children move to applying their times table knowledge to using efficient jumping (second number line). 

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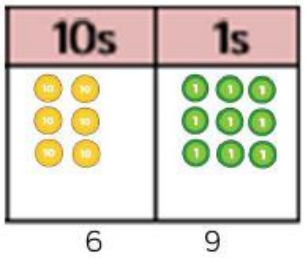
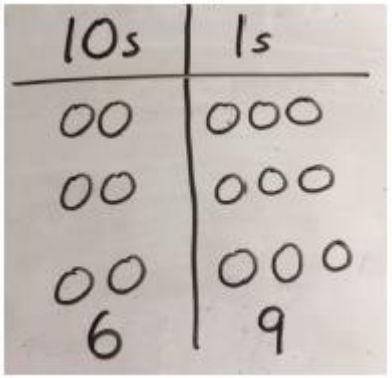
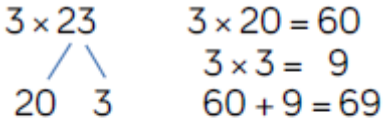
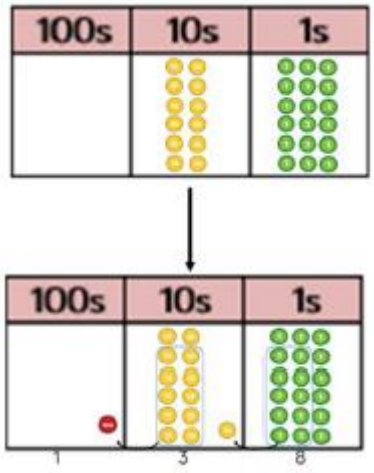
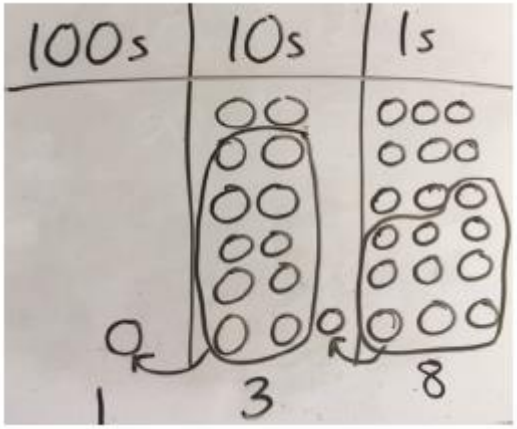
5.Introduction to formal written method **partition, tens, ones, place value**	Using place value counters (Base 10 could also be used). 3 x 23 	Children represent the place value counters pictorially. 	Children record their process to show their understanding.  23 × 3 69
6.Formal written method continued.	Using place value counters (Base 10 could also be used). 6 x 23 	Children to represent the counters/ Base 10 pictorially. 	6 x 23 = 23 × 6 138 1 1 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224

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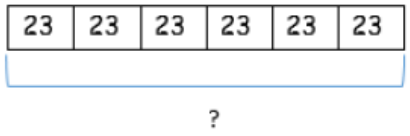
Conceptual Variation: **different ways to ask children to solve 6 x 23**



Mai had to swim 23 lengths, 6 times a week.
How many lengths did she swim in one week?

With the counters, prove that 6 x 23 = 138

Find the product of 6 and 23

$6 \times 23 =$

$\square = 6 \times 23$

6	23
× 23	× 6

What is the calculation?
What is the product?

Mental Strategies

- Counting in multiples
- Repeated addition
- Arrays
- Links to doubling, including doubles to link x2, x4 and x8 tables
- Reorder calculation (**commutative**)
- Using known facts and place value
- Use the rule of **associativity**
- Scaling up using known facts
- Using the relationship betwenn multiplication and division
- Use partitioning and **Distributive Law** to multiply
- Use **factor pairs** and the **Associative Law** to multiply
- Recognise and use square and cube numbers

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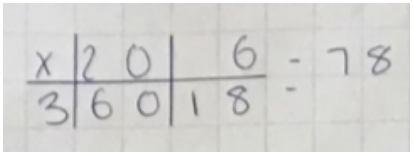
Written Methods of Multiplication

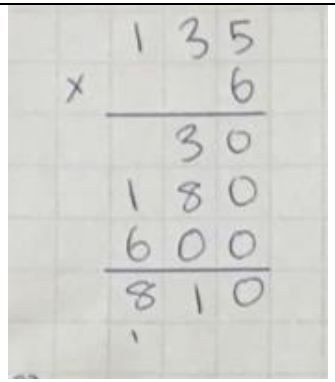
Grid Method

20 x 3



Expanded form

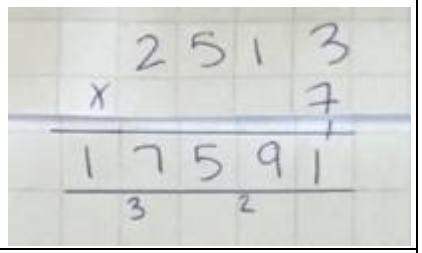
135 x 6



Teaching Point

Do not stay here. Quickly progress onto compact as soon as possible

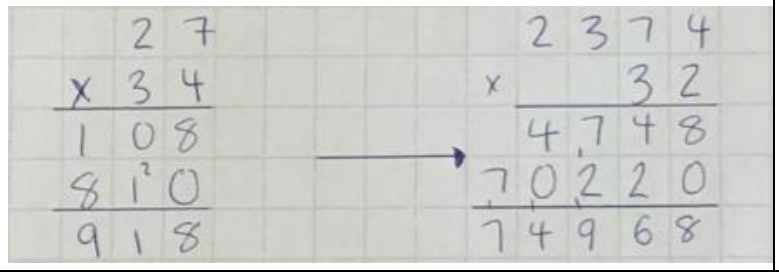
4 digit multiplied by a 1 digit



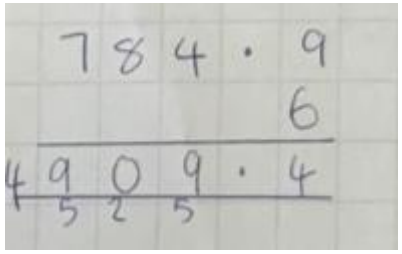
Long multiplication

Teaching Point

Make Place value explicit. You are multiplying by 30 not 3. Multiples of 10 end in a zero, we can add the zero at the start.

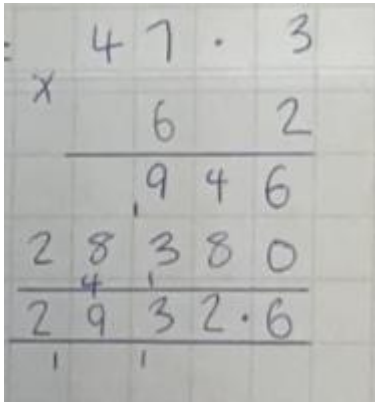


Multiplying decimals by integers – apply context of money and measure



Teaching Point

Ignore DP to start with. Complete calculation and then count DP back in e.g. 1DP in questions means = 1DP in answer.



Teaching Point

Ignore DP. Make it clear to line up as normal 3 digit x 2 digit, then count in DP after, otherwise place value is confused and method can become compromised.