Year 4 Unit 3: Multiplication & Division (3 weeks)
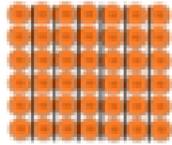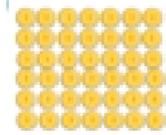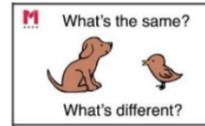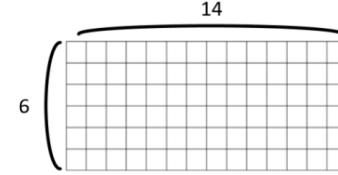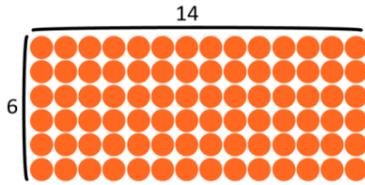
Before you start…
- *Are your pupils familiar with the use of arrays to represent multiplication and division, and can they explain the different calculations one array can represent?*
- *Do they have a firm understanding of the commutativity of multiplication and the link between multiplication and division?*
- *Do you know which facts and which pupils have secure recall?*

Why array?
This article considers why the use of arrays are so important in supporting conceptual understanding.
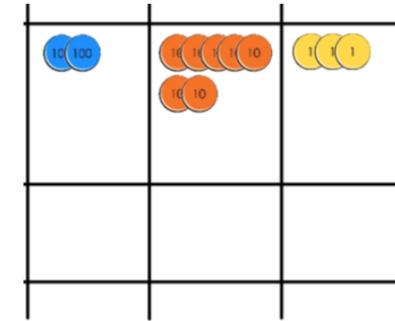
Video: *Multiplying three one-digit numbers*

What's the same? What's different?

$6 \times 14 =$

14

6

14

6

Video: *Short multiplication with place value counters*

Video: *Short multiplication with Dienes*

$$\begin{array}{r} 2\ 7\ 3 \\ \times\quad 3 \\ \hline \end{array}$$

Estimate: 900

$273 \times 3 =$

Deriving multiplication and division facts
L1 Derive facts to multiply mentally
L2 Derive facts to divide mentally

Pupils are encouraged to make connections between known facts, drawing on their growing range of mental strategies. Place value counters are used in arrays to support these connections.

? *How would you respond to a pupil who says 'to make a number 10 times greater, add a zero'?*

Exploring properties of multiplication
L3 Calculate multiplication facts using distributive law
L4 Apply distributive law to multiply 2-digit numbers by 1-digit numbers
L5 Explore multiplying three 1-digit numbers

Pupils combine multiplication and addition to explore the distributive law. Pupils connect the abstract calculations to various representations to deepen understanding.

? *What language would you expect pupils to use to describe the distributive law?*

Using and explaining short multiplication
L7 Short multiplication 1
L8 Short multiplication 2
L9 Applying multiplication strategies

Pupils are introduced to the formal written method of short multiplication. Build upon the knowledge of derived facts and the distributive law to help pupils understand what is happening as each step of the procedure is carried out.

? *How will pupils' knowledge of the distributive law and derived facts support their calculations?*

L6 is the suggested time for a consolidation lesson. It is imperative that pupils are confident in using mental strategies to multiply numbers before moving onto short multiplication.

Understanding division
This article provides some suggestions for supporting understanding of division.

Dear Parent/Carer,

Thousands | Hundreds | Tens | Ones

$$\begin{array}{r} 3\ 2\ 1\ 2 \\ 3\ \overline{)\ 9\ 6\ 3\ 6} \end{array}$$

$125 \div 5 = \square$

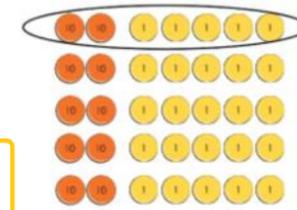125

Video: *Modelling short division with place value counters*

Problems with a number of possible strategies for solving or requiring further exploration will ensure a greater level of mathematical thinking and can promote intellectual curiosity.
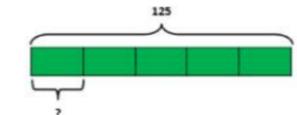
Applying in further contexts
L14-15 Apply multiplication and division to problem solving

Planning a trip to Canada is the context provided for problem solving. Consider contexts that are relevant and engaging to your pupils, adapting as necessary. Pupils should be confident in exploring and making sense of the problem (before solving) with the use of bar models to emphasise the structure.

Using and explaining short division
L12 Short division 1
L13 Short division 2

Pupils are introduced to the formal written method of short division. Build upon understanding of multiplication to help pupils understand what is happening as each step is carried out.

? *How will you develop connections between the abstract calculation and the manipulatives chosen to represent them?*

Exploring mental division
L10 Mental division strategies
L11 Explore division using known and derived facts

Connections are made between multiplication and division as pupils explore mental strategies for division. Bar models can help to make sense of the problem and use of place value counters represent the number and support grouping for mental division.

? *How can a number line support informal division strategies?*

Explaining the written division method is harder than doing it! Think carefully about the equipment, words, movements and gestures you and your pupils use.