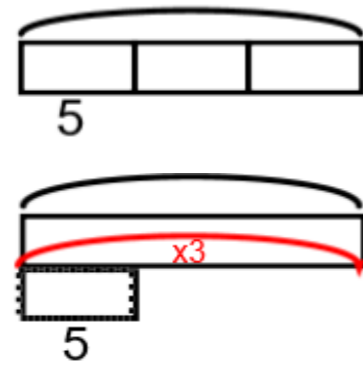


# Year 3 Unit 7: Deriving multiplication and division facts (3 weeks)

## Before you start...

- Have your pupils had prior experience of 'equal parts' and 'times greater' bar models?
- Do they understand how to partition numbers into tens and ones?



**Video:** Bar modelling – Comparing multiplication bar models

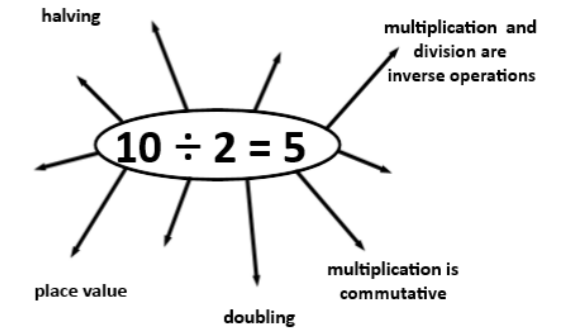
hundreds	tens	ones
	1	2
1	2	0

**Video:** Multiplying and dividing integers by 100

## Why array?

This [article](#) considers why the use of arrays are so important in supporting conceptual understanding.

If I know  $10 \div 2 = 5$ , what else do I know?



## Comparing multiplication structures

L1 Compare multiplication structures

Multiplication can be seen as 'equal parts' or as 'times greater'. Pupils explore word problems, build bar models to represent them and think about how to interpret the calculations used to solve them.

? Can you think of some contexts for each of the bar models shown above?

## Multiplying and dividing using place value

- L2 Multiply by 10 and 100
- L3 Link place value with multiplication
- L4 Divide by 10 and 100
- L5 Multiplying and dividing by 10 and 100

Pupils use Dienes, place value charts and counters to explore multiplication and division by 10 and 100. Explore that when **moving** to the left, digits have a value that is ten times greater and **moving** to the right, digits have a value that is ten times less.

? How would you respond to a pupil who states 'to multiply by 10, add a zero'? How could this lead to misconceptions?

**Video:** Deriving facts

## Applying learning from L1 – L5

- L6 Explore division strategies
- L8 Derived facts

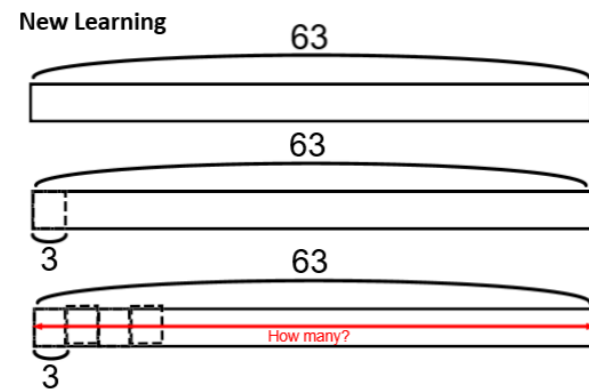
Pupils explore how dividing by grouping gives the same result as dividing using place value (covered in L2-L5). Apply learning from L1-L6 to derive new facts.

- ? How will you establish routines that ensure pupils refer to the known facts they are using?
- ? What benefits can you see to establishing this routine?

**Video:** Bar modelling - Division as grouping

**Video:** Bar modelling - Division as sharing

**Video:** Bar modelling- Division as times smaller



**Video:** Multiplication by partitioning

**Video:** Multiplication with regrouping by partitioning

$$48 \div 4 =$$

thousands	hundreds	tens	ones

## Solving word problems

- L13 Solve multiplication and division word problems
- L14 Solve word problems involving the four operations

Pupils apply the understanding developed within this unit by solving word problems.

? How will you demonstrate the process of creating a bar model, using known and unknown values from word problems?

L12 is the suggested time for a consolidation lesson. However, you may wish to spread L9 across two lessons to ensure pupils have developed a depth of understanding using Dienes before moving on to using place value counters.

## Multiplying and dividing 2-digit numbers

- L9 Multiply a 2-digit number (no regrouping)
- L10 Multiply a 2-digit number (with regrouping)
- L11 Divide a 2-digit number (no regrouping)

Pupils multiply and divide 2-digit numbers by partitioning. Multiple models are used to support the development of understanding and the suggested route begins with using arrays of counters, moving to using Dienes, followed by use of place value counters.

- ? How familiar are pupils with the suggested concrete manipulatives?
- ? What multiplication and division concepts do the different manipulatives stress and ignore?

L7 is the suggested time for a consolidation lesson to allow time for building confidence before extending to work with larger numbers.