

# Year 6 Unit 2: Multiplication and Division (3 weeks)

## Before you start...

- How secure are pupils in their knowledge of multiplication tables?
- What mental strategies do pupils have for doubling and halving numbers?
- What prior knowledge do pupils have with multiples, factors and prime numbers?

Video: Reassigning Dienes: thousandths

## Exploring decimal place value

L1 Understand decimal place value to 3 decimal places

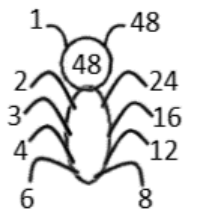
Pupils extend their understanding of decimal place value to three decimal places with consolidation and development of thousandths. Take time to explore the relative magnitude of this unit compared to others. In this lesson, Dienes equipment is repurposed to represent decimal numbers, supporting pupils' understanding of place value.

## Multiplying and dividing by powers of 10

L2 Multiply and divide by powers of 10

Pupils consolidate and extend their understanding of multiplication and division by powers of 10. Consider how misconceptions relating to adding and removing zero can be planned for and how modelling can support conceptual understanding. Pupils apply their knowledge of multiplying and dividing by 10, 100 and 1000 in context using metric units of measure.

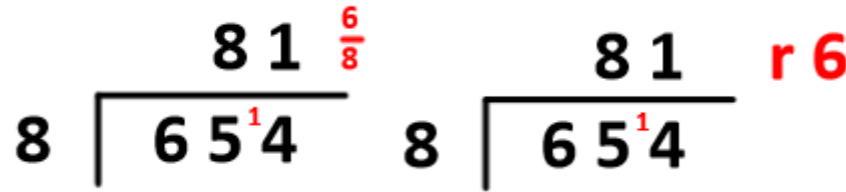
? How will you expect pupils to explain the process of multiplying and dividing by powers of 10 and how will your modelling support this?



## It's the way you say it...

When explaining formal written methods, it is easy to resort to using digit names as opposed to recognising the place value of the digit. Encourage pupils to articulate the steps using place value language e.g.:  
 $273 \times 6 =$   
 'Seven tens multiplied by six is equal to 42 tens or 4 hundreds and two tens.'  
 '70 multiplied by 6 is equal to 420.'

Video: Interpreting remainders



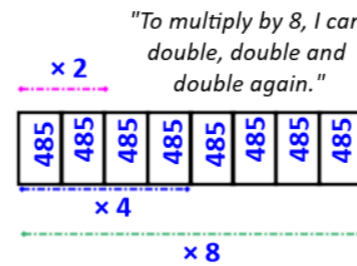
Video: Short division

Video: Long division

You may wish to use Lesson 14 to practice solving problems using all four operations. Lesson 15 is a suggested consolidation lesson and should be used depending on the needs of pupils.

Lesson 9 is a suggested consolidation lesson. You may wish to use this at a different point to consolidate key knowledge.

Video: Factor buggin'



## Knowing number properties

L3 Identify common factors and multiples  
 L4 Identify prime numbers

Pupils may have some familiarity with properties of number from previous years and so these lessons should be adapted to suit the needs of pupils. In lesson 3, multiple representations are used to show factors and the concept of common factors is introduced and explored with an emphasis on verbal explanation. Factor bugs are a particularly useful representation to systematically find all factors. In lesson 4, this knowledge is applied to identify prime numbers and pupils apply understanding through playing a game. Take time to explore and discuss the number one, which is not a prime number.

## Applying division strategies

L10 Explore efficient division strategies  
 L11 Use the formal short division method  
 L12 Use the formal long division method  
 L13 Interpret remainders

Pupils deepen their understanding of strategies for division. As with other operations, many pupils select a formal written method automatically and so time should be taken in lesson 10 to explore other strategies and encourage pupils to consider the numbers in each problem to select an efficient strategy. In this lesson, doubling and halving strategies are developed along with using known facts to derive other division facts. Lesson 11 and 12 introduce using the formal written short and long division methods for 3- and 4-digit numbers divided by 1- and 2-digit divisors. As with multiplication methods, take time to clearly model and articulate each step with reference to place value to deepen conceptual understanding of the procedure. In lesson 13 pupils explore remainders, considering problems where the context defines how the remainder is interpreted when answering.

- ? How will you encourage pupils to recognise when use of mental division strategies is more efficient?
- ? What contexts might pupils be familiar with where they interpret remainders in different ways?

## Applying multiplication strategies

L5 Solve problems using known and derived facts  
 L6&7 Use the formal short multiplication method  
 L8 Use the formal long multiplication method

Throughout these lessons, pupils should be encouraged to apply estimation strategies developed earlier in the year to check the reasonableness of their answer. Pupils should also represent problems pictorially to show the relationship between known and unknown values, such as by using bar models. In lesson 5, pupils consolidate mental strategies for multiplication using known facts in the context of currency conversions. Lesson 6 and 7 develop the use of the short formal method for multiplication, including decimals. Pupils should be able to articulate each step of this process using correct place value language to deepen conceptual understanding and modelling should make use of representations to make the steps of the procedure clear. In lesson 8, the formal long multiplication method is introduced including 4-digit by 2-digit multiplication and multiplying decimal numbers. Pupils should draw on their understanding of multiplying by powers of 10 to support their calculation.