

Year 4 Unit 8: Decimals (3 weeks)

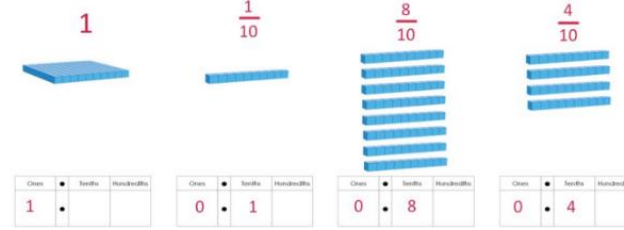
This is the first time pupils use decimal notation for tenths and hundredths. Before you start, consider:

- How confident are pupils with fractions from previous units?
- Can pupils confidently and flexibly use Dienes to represent number?
- Money is a useful context for calculating with decimals. How much familiarity do your pupils have in using money, both in and out of school?

In order to support development of conceptual understanding of decimals, Dienes are re-assigned to allow for representation of decimals. Clarity of language is crucial as tens Dienes are now re-assigned as tenths. You may wish to give pupils time to explore this within Maths Meetings or during consolidation lessons.

Video: Re-assigning dienes: Tenths and hundredths

Discuss the further two examples, 0.8 and 0.4.



*These lessons have been grouped in the Unit Narrative as they cover similar objectives. You may wish to keep these lessons in sequence together and teach both following Lessons 8-10.

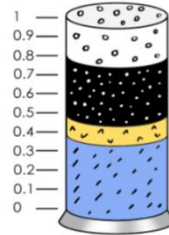
Video: Comparing decimals

Exploring fractions and decimals

- L1 Recognise and write decimal equivalents of any number of tenths
- L2 Recognise quantities as decimal tenths

Pupils make connections between their existing understanding of fractions of shapes, amounts and abstract representations. They use a range of contexts to build a deeper understanding of the links between fractions and decimals.

- ? How might you emphasise links between fractions and decimals?
- ? How will you support pupils to see the similarities in counting in ones and/or in decimals?



Comparing and ordering numbers with one and two decimal places

- L3 Compare numbers with one decimal place
- *L11 Order numbers up to two decimal places

Pupils should start to compare decimal numbers and use similar strategies as when comparing integers to help reason when comparing and ordering. The latter of the comparison lessons has been left until after pupils have explored decimals with hundredths (L8-10).

- ? How will you ensure that pupils can explain how a decimal with one decimal place might be greater than a decimal with two decimal places?
- ? Can decimals be odd or even? How could you deal with potential pupil responses to this?

Rounding decimals to the nearest whole number

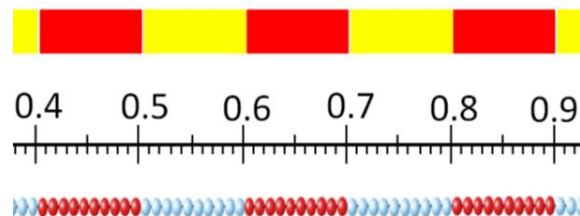
- L4 Round decimals with one decimal place to the nearest whole number
- L5 Round to the nearest whole number in order to investigate a problem

Number lines are the chosen representation when rounding, where pupils explore how the decimal sits on a number line in relation to other numbers. There is a focus on pupils explaining 'why' and 'how' they have used a strategy for rounding.

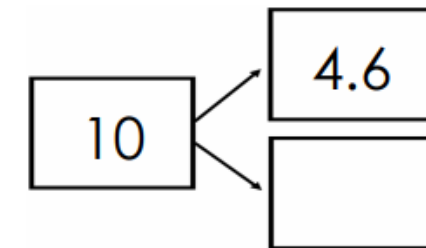
- ? How do you encourage those with procedural strategies to explain how their strategy works?
- ? Are pupils fluent in their understanding of rounding? Can they give a range of possible answers?

Unleash the Power (of ten)

This [article](#) by Barbara Carr in the NCETM discusses the powers of ten, and links it to measurement.



Video: Using a bead string to represent decimals



Multiplying and dividing decimals by 10 and 100

- L12-13 Multiply and divide by 10 including decimals
- L14-15 Multiply and divide by 100 including decimals

Pupils should now use their growing confidence with decimals to multiply and divide by 10 and 100. Make connections with pupils' understanding of integer multiplication and division.

- ? What experiences will you provide so that pupils can explain and understand the trick of 'moving the decimal point'?

Representing and writing decimals

- L8 Recognise and write decimal equivalents of any number of hundredths (using Dienes)
- L9 Recognise and write decimal equivalents of any number of hundredths (using bead string)
- L10 Recognise and write decimal equivalents to one quarter, half and three quarters

Reassigning the value of Dienes allows pupils to make connections and deepen understanding of decimals. Connections should also be made to pre-existing use of decimals (such as money) and the misconceptions that this may bring.

Calculating with decimals

- L6 Derive number bonds for numbers with one decimal place
- L7 Mentally add and subtract numbers with one decimal place

Pupils build fluency with decimal numbers by investigating and identifying number bonds. This knowledge supports pupils to add and subtract decimals with one decimal place.

- ? How will pupils deepen their conceptual understanding of decimals through pictorial and concrete representations?

Reading 0.23 as 'zero point twenty three' can create problems when comparing decimals as it leads to the reasoning that 23 is greater than three so 0.23 is greater than 0.3.

Videos: Multiplying and dividing by 10 with decimals
Videos: Multiplying and dividing by 100 with decimals

Video: Common decimal difficulties

A common misconception for pupils is to write three hundredths as 0.3 or to be unsure on the value of a zero in decimals such as 0.3, 0.03, 3.0, 3.00, 3.03, 3.3, 0.33. Allow pupils time to explore and internalise the impact of the position of zeros within decimal numbers.