

Year 2 Unit 15: Exploring calculation strategies (2 weeks)

Before you start...

- How confident are pupils in using mental strategies for 2-digit addition and subtraction?
- To what extent can pupils use bar models to represent problems? Would consolidation in Maths Meetings prior to starting this unit support pupils?
- How much experience have pupils had in partitioning 2-digit numbers?

Video: Mental addition using Dienes

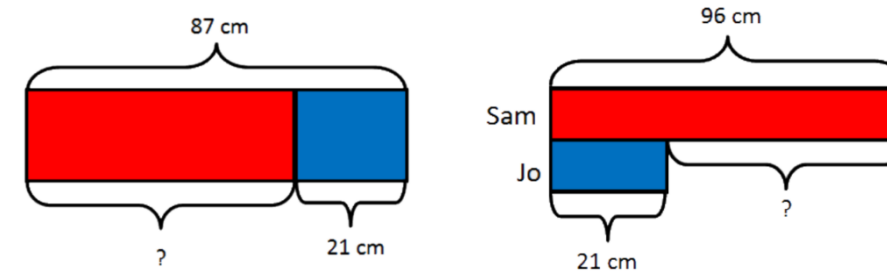
Video: Mental subtraction using Dienes

Video: Mental addition using Dienes (partitioning one number)

These lessons are a great opportunity to assess pupils' confidence and retention of the strategies that have been taught over the year. Within the lesson, AfL may highlight that further consolidation of strategies is required. This may inform the use of a consolidation lesson or planning of Maths Meetings.

Bar Modelling

Bar models are amazing tools for thinking. Being able to use them to make sense of problems takes time and needs to be regularly practiced. You may want to use Maths Meetings to 'rinse' bar models. In addition to the videos listed, there is an [E-learning module](#) and [Whole School Workshop](#) available.



Video: Bar modelling: Combination and partitioning

Video: Bar modelling: Augmentation and reduction

Video: Bar modelling: Comparison structures

Reviewing addition and subtraction strategies

- L1 To apply addition strategies to solve equations
- L2 To apply subtraction strategies to solve equations

Pupils are given the opportunity to apply strategies they have learnt over the year to solve different equations. As much as possible, allow pupils to attend to the similarities and differences between strategies and encourage pupils to justify their reasons for choosing a particular strategy.

- ? How can you provoke pupils to compare and contrast strategies?
- ? To what extent are pupils able to explain why one method is more efficient than another?

Making sense of problems using bar models

- L3 To solve part-whole word problems
- L4 To solve comparison word problems

Pupils use bar models to represent and help make sense of word problems. The correct operation may not be immediately identified, and pupils will need to explore how they use their part-whole and comparative knowledge to create bar models to show the known and unknown parts of a problem. The focus in the first half of each lesson is on understanding the problem as opposed to simply finding a solution.

- ? How will you support pupils in using the key language and sentence structures within these lessons (known, unknown, part, whole)?
- ? To what extent can pupils explain the differences between part-whole and comparative bar models?

There are two consolidation lessons within this unit and you may wish to consider where to utilise these. To do this, think about the needs of your pupils.

- How confident are they with using bar models?
- How familiar are they with the range of strategies explored?
- How comfortable are they using and manipulating Dienes?

Partner A: Represent the equations using Dienes on a place value chart.

Partner B: Represent the equations using numerals on a place value chart.

Swap and repeat

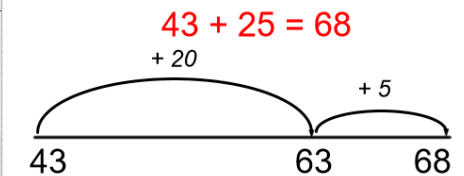
This is a great time to challenge pupils to think mathematically while reviewing strategies. Ideas for Depth such as 'finding all the possibilities' with missing numbers allows pupils to use their understanding of addition and subtraction to generalise.



Spot the mistake
 $46 + 25 = 61$



What's the same and what's different?



Subtracting 2-digit numbers

- L7 To subtract 2-digit numbers (no regrouping)
- L8 To subtract 2-digit numbers (with regrouping)

Pupils begin using an expanded method to subtract representing the method alongside Dienes, which supports their understanding of partitioning. Pupils then use Dienes and a clear language framework to enable them to explore subtraction calculations, making sense of when regrouping is involved.

- ? How can you challenge those who are confident in regrouping (both addition and subtraction) to deepen their understanding further?
- ? How will you (and any additional adults) use thinking aloud while modelling to illuminate and reinforce regrouping?

Video: Addition partitioning and regrouping with Dienes

Watch out! Common misconceptions

When subtracting, pupils may 'swap' digits. E.g. with $44 - 17$ pupils may do $7 - 4$ rather than $4 - 7$.
When adding, pupils may regroup all the ones for one ten rather than only 10 ones. Align 10 ones next to one ten stick to reinforce the equality.

Adding 2-digit numbers

- L5 To add two 2-digit numbers (no regrouping)
- L6 To add two 2-digit numbers (with regrouping)

Pupils explore addition without regrouping before moving onto add involving regrouping. This is first introduced through expanded methods, going into more formal written methods. Throughout these lessons, ensure that understanding is reinforced through the careful use of manipulatives and representations such as Dienes on a place value chart.

- ? How can sentence structure and oral rehearsal reinforce the connections between manipulatives and written methods?
- ? How are pupils able to justify and reason the concept of regrouping?

If pupils are not ready for columnar written methods, provide opportunities for them to gain a deep understanding using Dienes, even more so when regrouping.