

Calculation in Subtraction

Tools to support

- Number lines
- Bead strings
- Arrow cards
- Objects/ counters
- Dienes/multilink
- ThHTU Place value cards

Key Vocabulary

Subtract, less, take away, less, one less, ten less, minus, difference between, exchange, regroup

How many less is... than...?

What is the difference between ...and ...?

Context

- Money
- Measures
- Decimals
- Percentages
- Temperature

Teaching points

Before beginning formal subtraction it is important to develop mental strategies embedded in a secure mathematical understanding;

- They need to be confident with number bonds for each number up to 20 so that when they need to exchange a 10 and end up with say 13-8 they do not need to count this on their fingers.
- When modelling formal subtraction it is important that the language we use avoids misconceptions such as referring to 50-20 as 5 take away 2. We need to reinforce that we are talking about 5 tens or 50 take away 2 tens or 20 so that children understand the value of the numbers they are subtracting.
- The numbers used in calculations need to be appropriate for the learner e.g. initially we would give numbers that don't require exchanging before we begin exchanging tens.
- Estimating and checking- Children must routinely use these skills when calculating to enable them to consider reasonableness of their answers. Checking could be using an inverse operation or an alternative method of subtraction.

Errors/Misconceptions

- Confusion using finding the difference strategies such as counting forward being confused with addition rather than subtraction
- Basic calculation errors when counting backwards
- Misapplying rules e.g. you can't take 9 away from 7 (Use physical objects here)
- Subtracting a 0 would still leave you with the original number (use physical objects to show this is the case)
- Not understanding exchange (Using dienes and concrete apparatus to model is essential here)
- Exchanging when 0 is a place holder
- Understanding that subtraction is not commutative. (The calculation can only be written as 345-23)

End of year expectations

EOY3: Columnar to 3 digits

EOY4: Columnar to 4 digits including uneven number of digits

EOY5: Columnar over 4 digits including uneven number of digits and decimals

EOY6: Larger numbers plus uneven number of decimals

Apparatus will be needed with each of these methods when first introducing them.

Number Lines

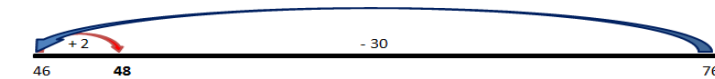
Subtraction here is taught as taking away (counting back) and finding the difference (counting up).

Counting back from a larger number

$$76-28=48$$

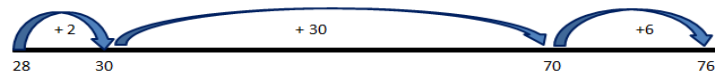


Compensation



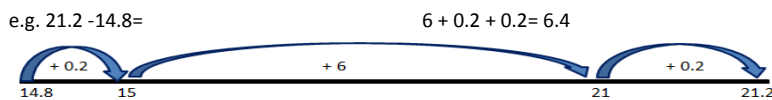
Counting up from smaller number (finding the difference)

Children are encouraged to count up to a multiple of 10 or 100.



$$40+6=46$$

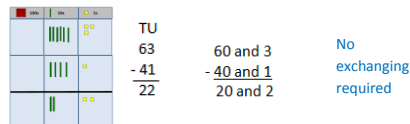
The same strategy can also be used with larger numbers or even decimals.



Partitioning

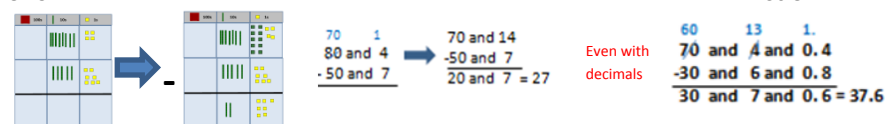
This phase will be longer than in the addition phase. Children partition the numbers into tens and units. This method is always supported with the use of practical equipment such as dienes.

$$63-41=$$



With exchanging

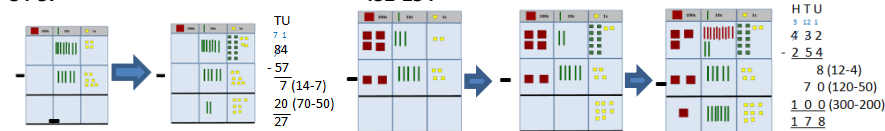
$$84-57=$$



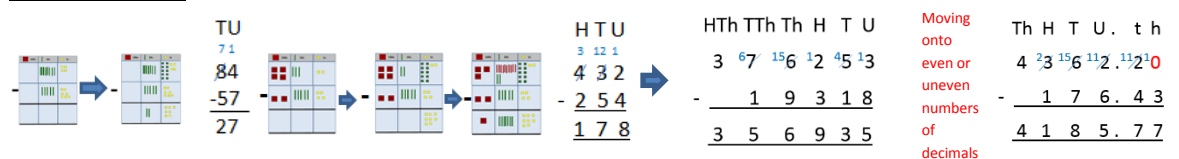
Expanded Column Subtraction

A way to set out an addition or subtraction calculation where the units, tens, hundreds (and so on) are arranged into columns.

$$84-57=$$



Column Subtraction



Moving onto even or uneven numbers of decimals

Th H T U . t h
4 3 15 6 12 12 10
1 7 6 . 4 3
4 1 8 5 . 7 7

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