

Guidance for teachers – Upper KS2 Number, Addition and Subtraction

Segment 1.29 Using equivalence and the compensation property to calculate

These short videos are intended to provide your pupils with interactive lessons while they are learning from home. You can choose how regularly you set them for your class. Some of the learning might be consolidation and practice which aids confidence and retrieval and helps build firm foundations for moving on to future areas of mathematics. It is important that pupils experience these in the suggested order. They have been designed to be a coherent sequence of learning which builds on previous understanding and exemplify a [teaching for mastery approach](#).

General features of a teaching for mastery approach, which can be found within these lessons:

- **Stem sentences** which promote precise mathematical vocabulary and generalisations for all pupils
- **Representations** which are carefully chosen and can be concrete, iconic or abstract and that move between the three.
- **Opportunities for deepening understanding for all pupils** - using small steps of learning enables pupils to learn together and gain deep conceptual understanding.
- **Independent practice and retrieval** - you could ask the children to send you their practice activities so that you can check understanding. You could also set supplementary activities, maybe from a textbook to extend practice and develop fluency in counting in steps of 2, 5 and 10.

Lesson 19 – This lesson draws attention to the structure of the calculations to generalise how the difference changes when only the minuend (and not the subtrahend) is changed. The calculations are intentionally kept simple so that attention is on the concept being introduced. The learning is drawn together to generalise: ‘If the minuend is changed by an amount and the subtrahend is kept the same, the difference changes by the same amount.’

Lesson 20 – Through identifying how the minuend and difference change missing values are found without having to recalculate. This is extended to larger numbers and decimal fractions, varying the position of the missing number, while keeping the subtrahend the same in all linked expressions.

Lesson 21 – Because children are now familiar with the generalisation: ‘If the minuend is changed by an amount and the subtrahend is kept the same, the difference changes by the same amount’, they are able to use it as a mental calculation strategy by relating a problem to a known fact. The teacher starts by looking at number bonds to 100 and then applying this to number bonds to 1 to encourage the children to develop their fluency. Using a fact such as $1 - 0.26$, the children look at the change to the minuend and the difference and work out, for example, $124 - 0.26$.

Lesson 22 – For any given calculation there may not be one best strategy, so children explore how calculations can be solved thinking flexibly rather than using a ‘fixed’ approach for each ‘type’ of calculation. Children might prefer to use ‘same difference’, or adjusting the minuend so that the difference becomes a multiple of ten and then adjusting the difference to reach the final answer or use a written method – the choice is theirs!

Lesson 23 – Further examples are used, where the scaffold is gradually decreased. Strategies are compared and the children are encouraged to consider which strategy they consider to be the most appropriate for the calculations shown. As in the previous lesson there isn’t one ‘fixed’ approach, so



explanations are encouraged to support children to think flexibly and to understand the connections between the place value, as well as addition and subtraction. This lesson completes this teaching point.

These lessons have been planned from the NCETM Mastery PD Materials. Please access the original materials [here](#).

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