

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 whilst 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 to extend practice and develop fluency in counting in steps of 2, 5 and 10.

Lesson 10 – After a review of the practice activity using known facts, the focus shifts to looking at how to find an unknown addend. The children look at examples where one addend is kept the same and the sum changes. This leads to the generalisation: ‘If the sum is changed by an amount and one addend is kept the same, the other addend changes by the same amount.’ which is then used to help to find an unknown addend.

Lesson 11 – The subtraction symbol can be associated with the words of ‘take away’ but in this lesson the subtraction structure of difference is looked at where nothing is taken away! Equations are written and values are compared such as $35 - 0 = 35$ and $45 - 10 = 35$, noting that calculations can have the same difference (answer) even though the subtraction calculation is not the same.

Lesson 12 – This short lesson provides children with the opportunity to deepen their understanding of the structure of subtraction as difference. They look at the ages of a dad (Jim) and his son (Max) on Max’s birthday over several years. Attention is drawn to the fact that there is always the same difference between their ages on Max’s birthday which is the same as when he was born.

Lesson 13 – Children are reminded of the terms ‘minuend’ and ‘subtrahend’ so that they can understand and use stem sentences that include them. They use ‘I’ve added _____ to both the minuend and the subtrahend, so the difference stays the same.’ and the stem sentence ‘I’ve subtracted _____ from both the minuend and the subtrahend, so the difference stays the same.’ to create the generalisation: ‘If the minuend and the subtrahend are changed by the same amount the difference stays the same.’

Lesson 14 – Using the understanding that if the minuend and subtrahend are changed by the same amount, calculations are transformed so that they are easier to solve. When looking at the subtrahend, you notice that if it is a multiple of 10 or 100 etc. it is easier to subtract it from the minuend, so by the end of the lesson children are able to transform 5-digit number subtraction calculations and know both how and why their transformation works.



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

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