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 15 – Using the generalisation: 'If the minuend and subtrahend are changed by the same amount, the difference stays the same.' calculations are transformed to make them easier to solve mentally such as 11.15 – 7.67. 0.33 is added to both the minuend and the subtrahend to transform the calculation to 11.48 – 8 which is easier as the subtrahend is a whole number.

Lesson 16 – In the previous lesson, when using the same difference, it was often the case that when the subtrahend was a multiple of 1, 10 or 100 etc., the calculation was easier to solve mentally. In this lesson, when the numbers involved do not lend themselves easily to a mental method, the minuend is then looked at to see how it can be altered to make the written method involve no exchange or fewer exchanges than the original calculation.

Lesson 17 – Being observant is the key in this lesson. Problems are presented where the children are encouraged to consider whether a mental strategy or a written method is the easier way to find the solution. When there is more than one way, any transformation should only be made where it makes the calculation easier.

Lesson 18 – This lesson now explores how the 'same difference' rule can be used not only to make calculations easier to solve, but also to balance equations. Using different contexts – and the generalisation from previous lessons – the children are encouraged to look at the connection between numbers either side of the = sign and consider how they have been adjusted to make the equation balance.

These lessons have been planned from the NCETM Mastery PD Materials. Please access the original materials here.