

Maths: Information

Introduction

The National Curriculum Mathematics Programmes of Study begin with the assertion that Maths is essential to everyday life, critical to science, technology and engineering and necessary for financial literacy and most forms of employment. The principles of the SEND Code of Practice (2015) thereby re-assert this in that the statutory requirements outlined in the code are founded upon successful preparation for adulthood, including independent living and employment.

Maths and SEND

The SEND Code of Practice (2015) states that “All pupils should have access to a broad and balanced curriculum...teachers should set high expectations for every pupil, whatever their prior attainment. Teachers should use appropriate assessment to set targets which are deliberately ambitious. Potential areas of difficulty should be identified and addressed at the outset. Lessons should be planned to address potential areas of difficulty and to remove barriers to pupil achievement. In many cases, such planning will mean that pupils with SEN and disabilities will be able to study the full national curriculum.” Therefore, as with all other subjects, it is the responsibility of the Maths teacher to provide high-quality teaching and learning for pupils with SEND.

The Mastery Approach and SEND

The Mastery Approach formed the revised national curriculum in 2014 to reflect the principles found in high performing countries. The core aim is to enable pupils to develop a deep understanding of maths at each stage. There is a great deal of overlap in best learning teaching practices for pupils with SEND and the methods advocated by the mastery approach. The focus on relational understanding (mathematical learning focuses on links and relationships) rather than instrumental understanding (rote learning) reduces cognitive load and over-reliance on working memory. Most pupils with SEND (particularly those with cognition and learning needs) will have more limited working memory than pupils with no SEND (exceptions may include some autistic pupils, who may have average to above average memory skills – you will probably know who these pupils are if you teach them). They are also more likely to have fewer ‘items’ or ‘schemata’ in their long term memory, due to the greater challenge of transfer from working memory; this has a cumulative effect, potentially increasing the gap between pupils with SEND and their peers over time.

Below, find outlined the benefits of certain mastery methods and strategies for teaching pupils with SEND.

Concrete and pictorial representations

The Concrete, Pictorial, Abstract approach (CPA) approach provide a ‘way- in’ to a topic to enhance real-life embed understanding. For many pupils, particularly those with cognition and learning needs, this approach can enable alternative representation and enable pupils to decode word problems.

Real life context

Setting the maths in a real-life context can help motivate and engage all children. Find opportunities to draw out maths every day inside and outside the classroom. This not only practises what they have learned but also helps them see how it is relevant to them.

Small steps of progress

Good maths progression breaks down complicated concepts into manageable steps, enabling children to focus on one new aspect at a time and build on understanding as the lessons progress. This targeted focus provides opportunities for success, which builds confidence and allows more time to be allocated to learning fundamental concepts.

Revisiting and reminding

This strategy requires the curriculum to include multiple opportunities to look at topics again in new contexts. This example of retrieval and spaced practice provides opportunities for over learning, supporting transfer of information to the long-term memory. Such strategies support pupils with SEND to become fluent. Additionally, it enables teachers to support students who have struggled with a topic to spend more time reconsidering and developing their understanding. This information will further inform the requirement of and focus for interventions.

Gradual reduction of support

It is not only the progress between each lesson that needs to be carefully planned, but within each lesson too. After introducing a new concept, allow children to practise what they have learned with gradually decreasing levels of support. For example, at first, they may need a carefully structured problem, complete with relevant models as they get to grips with the new method. You can then start to reduce this support bit by bit, so that the children are doing a little more for themselves with each new question. This allows them to build confidence and procedural fluency.

Pre-teaching

Going through some key ideas with pupils in short targeted sessions before the topic is taught enables them to have a head start and be prepared for what's coming up often hugely increasing confidence and participation at the start of a topic.

Intervention

Finally, as explored in the intervention section of this training providing additional out-of-class support after lessons can help to close gaps and/or deepen understanding.

What about adaptation, differentiation and Mastery?

The mastery approach suggests that, as far as possible, pupils should stay together on the same topic with necessary adaptation and differentiation such as removing barriers and providing targeted support, but without the need for many levels of worksheet for every single step. Recommended schemes include examples of 'low floor, high ceiling tasks' that support this approach to differentiation together with reasoning and problem solving questions that will challenge all pupils and allow the 'quicker graspers' to look at the maths in greater depth.