

Numicon Project Report 2008-2009

Context

Last year, 10 schools embarked on a project to investigate how Numicon can be used to support raising achievement in mathematics in KS1. The project responded to local concerns surrounding standards in mathematics, specifically calculation at the end of the foundation stage and the proportion of children achieving a 1a/ 2c at the end of KS1.

The project was launched in July 2008 and lasted for 3 terms, consisting of:

- centrally based LA CPD for individual class teachers and a teaching assistant
- in-school consultant support
- numicon resources were provided for participating schools to enable them to trial their use in F2, Year 1 and 2.

Numicon is a multi-sensory mathematics resource which supports early mathematicians to understand number values and relationships alongside the written numerals. Numicon encourages children to develop their understanding through mental imagery as they manipulate the Numicon tiles to calculate in practical activities.

Teachers were encouraged to continue to plan from the Primary Framework, whilst incorporating Numicon, as part of quality first teaching, when the objectives focused on number or calculation. As the project progressed, teachers became more confident and found additional opportunities to use Numicon, for example, using the tiles to sort in data handling, as well as finding more creative uses in other curricular areas.

Specific children working below age related expectations were tracked as part of a target group. In some cases these children received focused learning activities through guided practice using Numicon to support their learning; others received additional intervention using the Numicon planning resources as an intervention programme.

Impact:

- Children found Numicon attractive, enjoyable and accessible, the children were eager to work with the Numicon tiles; they quickly made connections between the tiles, their shape and corresponding numbers, far more quickly than expected.
- Target children were more confident, re-engaged and participating in whole class activities. "The more I use it the more I learn."
- Visual images of numbers began to become embedded in pupils' minds in a variety of multi-sensory ways including physical manipulation of Numicon tiles, observing their different colours and sizes, exploring patterns of holes, pattern-making with tiles; children were observed drawing the tiles to support themselves when applying their mathematical understanding in science.
- Numicon's availability as a resource in classroom as well as its use in teacher/ TA -led activities fostered learners' familiarity and confidence with the equipment. Teachers found very quickly that Numicon began to take over, the children wanted to continue their learning and explore Numicon further at wet play-time, and were more confident and engaged during QFT.
- Learning environments changed, Numicon began to appear in water trays, sand pits and outside areas to support independent child initiated learning, as well as on classroom display boards.
- Teachers welcomed the resource, and recognised that it is an additional resource to compliment effective strategies and materials already in place, and should not be seen as the only resource. It was noted that to fully support the children's learning Numicon needs to be embedded throughout the foundation stage and KS1.
- Teachers commented that Numicon supported children in learning specific concepts that in previous years had been difficult or in some cases not understood- in particular, number bonds to 10 as rapid recall (instead of calculations,) one more and one less, odd and even, understanding subtraction as difference, as well as 'take away,' inverse operation, repeated addition and its link to multiplication. "I only wish I had these materials sooner!"

Children within the target group made progress, in some cases the children made accelerated progress. The target group consisted of 42 children, of these children 88% made average or better progress, with 29 making 3 part levels or more. There was an increase of 15 children achieving end of year age related expectations.

Some schools reported higher than expected numbers of 6+ in F2 this year, with some children achieving 8 in calculation.

In most schools the percentage of children working at age related expectations or above had increased by the end of the year, demonstrating accelerated learning, not just for those children within the target group.

What worked well?

Those schools that made significant progress were ones which engaged fully in the project; those which purchased additional materials to support parallel classes; those that provided staff with non contact time to share experiences, progress and time to plan next steps together; those that made Numicon a whole school priority even when the initial focus was QFT in KS1; and finally those that involved senior leaders, mathematics subject leaders and SENCOs in the strategic planning to sustain improvements for the future.

The majority of schools are continuing with their use of Numicon with the foundation stage and KS1 to sustain the progress made last year, and to build capacity for further progress in the future. Some of the schools are exploring the impact of using Numicon in KS2, as part of QFT and as an intervention.

Lessons learnt

Modifications to the project were made before the start of the targeted collaborative support this year. The major change is widening the invitation to include the Mathematics subject leaders as part of the centrally based LA CPD with the expectation that schools will be able to drive forward improvements across the school strategically. More CPD has been added to enable teachers and TAs to develop teacher subject knowledge, in particular the complexities of early number and calculation, moving children from concrete to abstract; and the specific barriers for early mathematicians.

Considering Numicon as a wave 2 and/ or 3 intervention is playing a greater role this year, in order to accelerate progress of under achieving children throughout the school.

Further considerations:

It was noted that further consideration needs to be made with regard to the involvement and role of parents and carers and the connections with Every Child Counts initiative (ECC).