National Sensory Impairment Partnership

BRIEFING NOTE

Date: February 2016

MATHEMATICS: A PROGRAMME TO HELP PRIMARY SCHOOL TEACHERS DEVELOP DEAF CHILDREN'S NUMERACY SKILLS

1. SUMMARY

This briefing is about a mathematics programme, published in 2009 by the University of Oxford, which has been found to be effective in improving deaf children's numeracy.

The programme is intended to be used mainly with deaf children aged 5 to 11, according to the individual child's needs. It consists of 11 units covering the four elements of learning mathematics:

1) The additive composition of number.
2) The inverse relationship between addition and subtraction.
3) One-to-many correspondence reasoning.
4) Addition and subtraction story problems.

The programme should be used mainly by primary school teachers, but parents can also get involved by playing the downloadable board games and online games with their children. This should be done in partnership with the child's teacher.

2. Acknowledgements

The mathematics programme was developed by Terezinha Nunes, Deborah Evans, Diana Burman, and Rosanna Barros at the Department of Education, University of Oxford. Its development was funded by National Deaf Children's Society and Nuffield Foundation and supported by the British Association of Teachers of the Deaf.

3. Introduction

The introduction of newborn hearing screening and the latest hearing technologies has meant that young deaf children now have more opportunities to hear language. This includes while observing or taking part in activities that are the foundation of mathematical understanding.

Despite this, many deaf children still find it challenging to develop numeracy skills. There is often less emphasis on this type of learning, and many people do not realise that it requires a great deal of often complicated language. Children need some complex linguistic understanding and the opportunity to discuss the processes they are using, and the problems they are trying to solve – and how.

Researchers at the University of Oxford developed a programme to help address these challenges. They found that the programme was effective in promoting achievement in numeracy, and that deaf pupils using the materials in this programme made better than expected progress.

A research paper[1] with more information about how the intervention programme was developed and tested is available for download.

4. Using the intervention programme

The programme is divided into 11 units, and should normally be used in order, although the units can be used more flexibly as needed.

To use the intervention, you will need to access the following:

- Information on the learning objectives for each unit – this section also outlines which of the materials below you will need for each unit, as well as other materials you will need.

  http://www.education.ox.ac.uk/ndcs/Resources/maths_learning_objectives.pdf

- Teacher's notes – these give more detailed instructions for each activity. The learning objectives explain which notes you'll need for each unit.

  http://www.education.ox.ac.uk/ndcs/Resources/teachersbook_exercises.pdf

- Pictures/resources – as explained in the teacher's notes, pictures/resources have been developed for some of the activities.

  Inversion pictures:
  http://www.education.ox.ac.uk/ndcs/Resources/picture_Inversion.pdf

  Correspondence pictures:
  http://www.education.ox.ac.uk/ndcs/Resources/correspondence_picture.pdf

  Additive composition activities:
  http://www.education.ox.ac.uk/ndcs/Resources/largerpics.pdf

- Child booklets – there are booklets for the child for each of the units.
  Unit 1 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week1.pdf

  Unit 2 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week2.pdf

  Unit 3 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week3.pdf

  Unit 4 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week4.pdf

  Unit 5 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week5.pdf

  Unit 6 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week6.pdf

  Unit 7 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week7.pdf

  Unit 8 child booklet:
  http://www.education.ox.ac.uk/ndcs/Resources/maths_week8.pdf

[1] www.education.ox.ac.uk/ndcs/papers/nunesandmoreno2002.pdf

Unit 9 child booklet:
http://www.education.ox.ac.uk/ndcs/Resources/maths_week9.pdf

Unit 10 child booklet:
http://www.education.ox.ac.uk/ndcs/Resources/maths_week10.pdf

Unit 11 child booklet:
http://www.education.ox.ac.uk/ndcs/Resources/maths_week11.pdf

- Board games-as explained in the teacher's notes, there are a range of games that teachers can play with the child to support their learning under this programme. See:
  http://www.education.ox.ac.uk/ndcs/Resources/board_games.zip

  There are also 30 web-based games for deaf children to play in their own time. These can be found on the Oxford University website in the numeracy corner.

  http://www.education.ox.ac.uk/ndcs/maths_corner.php

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6. More information

More information about the University of Oxford's work in this area can be found at
http://www.education.ox.ac.uk/ndcs/ndcs_numeracy.html

Information about other teaching programmes developed by the University of Oxford and the National Deaf Children's Society can be found at:

- http://www.ndcs.org.uk/workingmemory
- http://www.ndcs.org.uk/morphology