

Independent Review of Mathematics Teaching in Early Years Settings and Primary Schools (June 17, 2008)

Note: *the sections below are taken from the final report and relate directly to children's mathematical graphics.*

Chapter 3: The Early Years

'The review should build on the recent renewal of the primary framework for mathematics and the EYFS'. Remit from the Secretary of State.

The following principal recommendations are made:

Recommendation 4: That the DCSF commissions a set of materials on mathematical mark making and children's mathematical development which can be used to support early years practitioners' CPD.

Recommendation 5: That the forthcoming review of the EYFS in 2010 considers the inclusion of time and capacity within the early learning goals.

Recommendation 6: That the DCSF continues to increase the proportion of graduate practitioners in early years settings, recognising the respective contributions of the Qualified teacher (QTS) and the Graduate Early Years Practitioner (graduate EYP). The review supports the goals that are currently in place.

p. 34: **Mathematical mark-making**

115. The EYFS guidance stresses the value of children's own graphic explorations, and it is common to see children from an early age making their own marks in role-play to communicate or act out activities they observe in adults, such as writing letters or making lists. It is comparatively rare, however, to find adults supporting children in making mathematical marks as part of a developing their abilities to extend and organise their mathematical thinking. While 'emergent writing' is a recognised term, that is not the case for 'emergent mathematical mark-making' (Ref. 20.). This misses a valuable opportunity to encourage early experimentation. The role of mark-making in children's cognitive development is set out in the taxonomy below. Early years practitioners should encourage mathematical mark-making and open-ended discussion in children's mathematical development.

Please see: Bob – please could there be a link here to go to the new page re: the taxonomy (see main body of email)

Recommendation 4: That the DCSF commissions a set of materials on mathematical mark making and children's mathematical development⁶ which can be used to support early years practitioners CPD.

Case study on mathematical mark-making

Redcliffe Children's Centre and Maintained Nursery School (Bristol) provides outreach work to 640 families, and educates and cares for children between three months to five years. Its head teacher Elizabeth Carruthers explains:

'We have observed that children make mathematical marks as well as marks for writing and one of our focuses is children's early mathematical graphics. We believe this is the very beginning of the process of children understanding the abstract symbolism of mathematics (Ref. 21).

The nursery environment encourages everyday opportunities for children to freely explore all kinds of mark making and some of their marks show their mathematical thinking or 'thinking in action'. Teachers and practitioners are supported in understanding these marks and interact sensitively with the children.

To support the children's mathematical thinking we plan open opportunities for free play and provide a variety of writing and drawing implements inside and out. Staff model written mathematics in purposeful contexts and assessment is from a positive perspective linked to Carruthers and Worthington's taxonomy. We share children's processes of thinking with parents and discuss opportunities for mark-making at home.'

p. 37: Implementation of effective early years mathematical pedagogy

119. To secure effective pedagogy, local authorities, leaders, managers and head teachers should provide the following key elements of support in order for all settings to develop the conditions for learning:

- A preliminary audit that supports the identification of strengths and areas for development within a setting
- A review of the mathematical learning environment which enables staff to monitor and evaluate resourcing and organisation for problem solving, reasoning and numeracy
- Examples of effective and good practice through modelling, demonstrating and coaching in order to enable settings to enhance the quality of their learning and development in problem solving, reasoning and numeracy
- Models of open questions and discussions and a mathematical language list to support staff in their dialogues with children

- A culture with a significant focus on mathematical mark-making in line with early writing through, for examples, role play and the use of popular mathematical signage in the environment
 - A learning environment that encourages children to choose to use their own mathematical graphics to support their mathematical thinking and processes
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References:

20. Carruthers, E. and Worthington, M. (2006) *Children's Mathematics: Making Marks, Making Meaning*. London: Sage Publications. Second Edition.
 21. Carruthers, E. & Worthington, M. (2005) 'Making sense of mathematical graphics: the development of understanding abstract symbolism' *European Early Childhood Education Research Association Journal*, (EECERA) Vo 13, No.1 (pp. 57 – 79).
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