

Get real

Make maths meaningful to young children by being less formal and looking at real life, says *Elaine Bennett*

In 2010, I had the pleasure of meeting Sir Peter Williams, author of *Independent Review of Mathematics Teaching in Early Years Settings and Primary Schools*, published in 2008. At the time, he questioned whether anyone would be interested in hearing about his two-year-old report. In fact, I refer to it constantly to this day, particularly the chapter on the EYFS.

Since publication, the EYFS framework has been revised and 'Problem Solving, Reasoning and Numeracy' replaced by 'Mathematics'. However, Sir Peter's observations and recommendations stand the test of time, as fundamentally they are about giving children the very best start in mathematical learning.

He highlighted the importance of the mathematically rich enabling environment and skilled adults who promote maths through spontaneous play and everyday routines. In 2014, a paper by the All Party Parliamentary Group for Maths and Numeracy reached similar conclusions.

Both reports emphasise play as the most effective way for children to learn – and are backed up by research, educational theory and the principles of the EYFS. Why, then, in many schools today, is maths being 'done to' children in large groups on the carpet, at tables, with pointless worksheets and even in workbooks?

Both reports also acknowledge many adults' bewilderment at maths when they were at school. So, doesn't this strengthen the case for making maths real and meaningful for children today?

There are other important questions that we need to ask ourselves. Are we 'doing maths to children' so they can reach the predetermined – some would argue, developmentally inappropriate – Early Learning Goals? Or are we striving to foster generations of learners who enjoy, understand, feel confident about and connect with maths, not just in their early years but for the rest of their lives?

If our approach to maths is formal, how can we honestly say that we are promoting the statutory Characteristics of Effective Learning – those learning behaviours, contained within the EYFS, that are the true indicators of future achievements?

What is indisputable is that the enabling early years environment is full of mathematical possibilities, with problems to solve and, as Linda Pound (2008) recognised, problems to find!

Ginsburg (2000) observed and recorded a group of four- and five-year-olds engaged in free play and concluded that although they did not always appear to be using maths, 42 per cent of the play that he saw included mathematical experiences. All play has the potential to be mathematical, in my opinion, and it is the adults and environment that can either help or hinder its inherent mathematical possibilities.

EVERYDAY MATHS THROUGH EVERYDAY PROVISION

Creative workshop

I often suggest practitioners don their maths glasses to assess where maths is, and isn't, happening in their setting. In my own classroom, the creative workshop (incorporating art and design technology aspects of Expressive Arts and Design) is a hotspot for meaningful maths.

Here, children self-select materials, estimate and calculate on a daily basis. So, making a model might involve gluing together cereal packets of varying shapes and sizes, measuring lengths of tape and using split-pins to let the wheels rotate.

Contrast this with a teacher calling children to a table to present and name some bright plastic 3D shapes, then asking them to repeat the names or colour in a worksheet of 2D images of the 3D shapes, before ticking a record showing that the children have 'done' 3D.

The problem with this approach is that the plastic shapes resemble nothing

FURTHER READING

- Bennett, E and Weidner, J (2011). *Everyday Maths Through Everyday Provision*. Routledge
- Ephgrave, A: *The Reception Year in Action* (2013); *The Nursery Year in Action* (2015). Routledge
- Chapter 3 of Sir Peter Williams' report, www.catchup.org/resources/605/independent_review_of_mathematics_teaching_in_early_years_settings_and_primary_schools.pdf
- www.foundationyears.org.uk includes: *Children Thinking Mathematically: PSRN essential knowledge for Early Years Practitioners*; *Mark Making Matters. Young children making meaning in all areas of learning and development*; and *Numbers and Patterns: Laying foundations in mathematics* (featuring a useful environmental audit)
- <http://earlyyearsmaths.e2bn.org> – a group of six nurseries and children's centres undertook a maths project. A treasure trove of ideas and resources
- <http://nrich.maths.org/early-years-maths-ideas-and-research>
- See Part 1 of our series by Judith Stevens on mathematical development and how to support it, in *Nursery World*, 25 January-7 February 2016



The best way for children to learn about

ing from the child's own experience, unlike the cereal packets, and maths learning becomes an abstract, adult-led – unengaging – exercise, rather than a child-led, 'real' experience.

Resource ideas

To promote mathematical thinking in your creative workshop, include:

- recycled materials for junk modelling (clean and safe to use)
- plastic containers of powder paints with baby milk scoops for measuring
- clean soap bottles filled with water (to add to powder paint)
- washed yogurt pots (for making powder paint in)
- colouring pencils sorted by colour
- paper and card
- glue sticks, PVA glue in small pots
- range of collage materials
- art and craft books to give ideas
- scissors, masking tape, sticky tape
- paintbrushes of various sizes
- wrapping paper/wallpaper
- fabric, wool, string.

Water area

Water play is a real draw for children, and crucial to their learning. For



maths is through engaging, real-life experiences, not pointless worksheets

example, Piaget (as quoted by Cooney, Cross and Trunk, 1993) argued that children need time to explore and develop an understanding of water before being 'taught' concepts such as volume and capacity.

I believe passionately in water play, inside and out, as each offers different types of experience. Over time, we have replaced 'water toys' with 'real', open-ended resources and now take a 'less is more' approach, in which shelves are labelled clearly and 'shadowed' (with silhouettes of resources to show where to store them). This has resulted in children selecting, and replacing, resources more carefully and being more engaged in their play.

Children in my class are able to explore volume and capacity daily by helping to fill and empty the water trays. The first time they overflow it, they learn an important lesson for next time! On one occasion a child was so eager to fill the indoor water tray that he filled the bucket to the brim, then could not move it – another important lesson.

Contrast this with a child being called to 'do' capacity on a worksheet, where they have to mark empty, half-

full and full pictures of measuring beakers. Again, such an approach is abstract and meaningless to the child, and can only have a damaging effect on their ability to engage in learning.

Resource ideas

To promote mathematical thinking in your water area, include:

- empty bottles and containers
- buckets, funnels, tubes
- guttering, pipes
- syringes and pipettes
- pots with holes

REFERENCES

- All Party Parliamentary Group for Maths and Numeracy (2014). *Maths and Numeracy in the Early Years*, <http://tinyurl.com/hc75ytu>
- Cooney, W et al (1993). *From Plato to Piaget: the greatest educational theorists from across the centuries and around the world*. University Press of America
- Ginsburg, H and Kyoung-Hye Seo, (2000). *What is Developmentally Appropriate in Early Childhood Mathematics Education? Lessons from New Research*. Columbia University
- Ofsted (2015). *Teaching and Play in the Early Years – A Balancing Act?*, <http://tinyurl.com/zjc76gn>
- Pound, L (2008). *Thinking and Learning About Mathematics in the Early Years*. Routledge
- Williams, P (2008). *Independent Review of Mathematics Teaching in Early Years Settings and Primary Schools. Final report*. DCSF Publications

- measuring cylinders, jugs, spoons
- water wheels, bubbles
- decorator's brushes in various sizes
- cups and teapots
- sponges, cloths
- food colouring, nets
- access to water!

THE PLAYFUL TEACHER

Recently, the Ofsted definition of teaching in *Teaching and Play in the Early Years – A Balancing Act?* (2015) came as music to the ears of early years practitioners committed to play-based learning.

In the report, Ofsted acknowledges that teaching doesn't just mean a top-down model but also encompasses the many interactions that practitioners have each and every day with children as they play, such as 'communicating and modelling language, showing, explaining, demonstrating, exploring ideas, encouraging, questioning, recalling, providing a narrative for what they are doing, facilitating and setting challenges'.

This is something we need to print out, put on T-shirts and wave happily in the face of anyone who enters our 'enabling environments' asking about maths-focused activities and teaching!

My own practice has been greatly inspired by the work of Anna Ephgrave and Ruth Moore at Carterhatch Infant School in Enfield, North London, where every interaction is viewed as a 'teachable' moment.

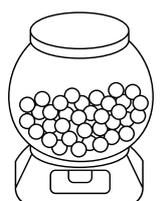
Maths is no exception. Every interaction that we have with children in that spontaneous play that Sir Peter spoke so passionately about is an opportunity for children to progress mathematically – be it in measuring, estimating, counting, calculating or exploring direction, space, time or speed...

So, if a child is making a hat in the creative workshop, the practitioner might model how to measure the card by putting it around the child's head, estimate the amount of sticky tape that is needed and talk about any patterns that the child creates in the decoration.

Tuning into children in this way and viewing every interaction as a 'teachable' moment has had a huge impact on my team, and has made maths about so much more than numbers for our children. ■

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G is for Gumball



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Gumball

Name..... Class.....