



## Research & Development Impact Report No.7

### How can we positively engage parents in their children's learning in Mathematics?

It was good to see my son having fun and enjoying the learning. It was good to see my son having fun and enjoying the learning. We loved all the games, bingo and 3 in a row are amazing.

Parent Harrington Hill School

"I was surprised by how much we enjoyed it together, and how much my daughter knows"

Parent Sir Thomas Abney

#### Who might find this research useful?

- Primary schools, EYFS settings and Secondary Special Schools, head teachers and practitioners who are interested in developing parent participation in children's learning, particularly in Mathematics.

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# Research & Development Impact Report

## HTSA – Ocean Maths Project: Engaging parents in children’s Mathematical Learning via whole class parent and child mathematics workshops.

<b>Project Participants</b>	9 schools (8 primary schools and one secondary special school) in Hackney, London. Mostly Year 2 classes with some Year 3 and Year 1 classes, and one Year 7 group at Stormont House Special School.	<b>Phase(s)</b>	Primary and secondary special schools
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### School context relevant to this research:

- HTSA consists of 13 primary schools, 3 secondary schools, one of which is a Secondary Special School, and 1 alternative provision setting, in North and East Hackney in London. The schools serve a wide range of varying demographic groups in an area of considerable social and economic deprivation. The area is richly multicultural, with 40 plus languages being spoken by children and families at schools such as Kingsmead Primary School.
- Whilst this project is focussed on helping schools to further develop parent partnership generally, we have chosen to focus on Mathematics. Mathematical competence is vital in accessing the benefits of modern life and employment. Mathematics was described in the introduction to the 2013 primary Mathematics curriculum as, ‘a creative and highly inter-connected discipline ... essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.’ Indeed, Kiernan and Mensah (2011) found that for young people from less affluent backgrounds, in particular, their ability to benefit fully from higher education and play a productive role in the workforce will depend on their mathematical competence. Many parents’ experience of school and learning, and at times failing to learn Mathematics has left them feeling uncomfortable or even unable to support their children in learning Mathematics even at a primary level.
- Many HTSA schools now support a rapidly changing demographic mix, as gentrification has brought a greater number of professional middle class families into the area. This effect is very different across different schools. The result is that schools must engage parents across a huge range of pre-existing levels of parent confidence, self-efficacy and agency, sense of belonging in the school environment and success in their own education and in Mathematics in particular. Parent Partnership strategies need to take such dynamics into account.

### Starting point(s)/ Baseline evidence:

#### **The Importance of Parental Engagement in Children’s Learning**

- Peter Williams (2008) called parents, ‘Children’s first and most enduring educators’. A wealth of research demonstrates the importance of parents’ engagement in their children’s learning to educational outcomes and to children’s life chances. Desforges and Abouchaar (2003) found that in the primary age range, the impact caused by different levels of parental involvement is much bigger than differences associated with variations in the quality of schools and that the scale of the impact is evident across all social classes and all ethnic groups. Indeed Sylva et al (2004) found that “For all children, the quality of the home learning environment is more important for intellectual and social development than parental occupation, education or income. What parents do is more important than who parents are.” Positive parent-child interactions contribute to a child’s readiness to learn and have a positive impact on children’s educational outcomes (Kiernan and Mensah 2011). What schools and parents do together matters.
- In order for schools to effectively engage all parents in children’s learning involves, among many other things, making their schools accessible, welcoming and respectful to all families, informing them about what their children are learning (in this case in Mathematics) and how they are learning it, and what parents can

do to support their children’s development as learners in a positive way. Schools also need to balance the varying expectations, experience and needs of different groups of parents. Schools work very hard to accomplish these things, but most admit that reaching all parents is challenging indeed.

- The Ocean Maths project, which began in Tower Hamlets, sought to engage parents who were mostly new to English in their children’s learning and in developing positive links with their children’s schools through Mathematics. In a context where many adults in the UK when asked report Maths as their least favourite lesson, with Brynner and Parsons (1997) pointing out that 30+ % of adults did not have the Mathematical knowledge and skills to get through an average day, and where the Every Child a Chance Trust report (2008) highlighted that those with poor Mathematical skills suffer life-long, and even inter-generational negative consequences, Mathematics is clearly an area where good Parent Partnership can have a big impact on children’s life chances.
- Given also the fact that how we teach children about Mathematics and what we teach them has developed and changed hugely since most current parents were at schools and even more since the introduction of the 2013 curriculum, there is a need to find some effective ways to engage parents in children’s mathematical learning, to inform parents of at least some of our current expectations and pedagogies in a useful and supportive way. This is not an easy task, as many parents, especially those who did less well in Mathematics, carry a good deal of anxiety about Mathematics. Many parents I have worked with via the Numbers Count Maths intervention work I have carried out, and via the last 18 months of this project have expressed strongly negative attitudes towards Mathematics and to themselves as learners of Mathematics. This is not exclusive to, but would seem much more prevalent in parents in low income or no employment. If we are to engage all parents, especially those whose attitudes and skills we would most like to change, we have to find a way of engaging everyone positively and supportively.

**Key R&D question(s)**

- How can schools support parents who have a wide range of experience, resources and attitudes, to positively engage with their children’s learning in Mathematics?
- Can the Ocean Maths Parent-Child workshop approach and its CPD methodology, be developed and adapted to effectively support parent engagement in Mathematics in the context of the 2013 curriculum in a wide range of educational settings?
- What might be an effective model for developing practitioners’ understanding of the issues of Parent Partnership, in particular in Mathematics, and their confidence and effectiveness in running high quality parent partnership projects?

**Intended successful outcomes**

- To contribute to improving pupil’s outcomes in learning Mathematics.
- To contribute to children developing deeper self-regulation, reasoning and problem solving abilities via engaging in low threshold, high ceiling hands on Mathematics activities.
- To contribute to improving parent engagement in the involved schools in general, providing one arena for developing liaison and communication between schools and parents
- To support parents in developing positive attitudes towards their child’s learning in mathematics and in their own ability to help

**How success will be measured?**

- As the impact of 3 Maths workshops over a year on pupil outcome would be a small part of the overall effect of their learning in school this project will initially rely on anecdotal evidence from teachers and schools
- Observations of children’s conversations in workshops. And reflections by class teachers should reveal evidence of engagement with reasoning and self-directed focus
- Parents report via questionnaires and in conversation about their experiences of liaising with their child’s school, show growing confidence
- Parents report via questionnaires and conversations re positive changes in their understanding and confidence in supporting

<p>their children learn.</p> <ul style="list-style-type: none"> <li>• To develop and share a range of family friendly home learning activities to support learning in all 3 aims of the 2013 Mathematics curriculum.</li> <li>• To begin to develop a CPD package to support schools and practitioners in developing and running parent partnership activities in general and specifically in Mathematics</li> <li>• To develop and share pedagogic tools for teaching Mathematics.</li> </ul>	<p>their children’s learning and on their enjoyment of the Maths activities presented.</p> <ul style="list-style-type: none"> <li>• Home learning activities developed and pack ready for distribution by September 2018</li> <li>• Draft of CPD package in place by July 2018 and ready for trade September 2018. In the form of 2 INSET sessions: set up and review, with written guidance, and optional support visits.</li> <li>• Parent Child Maths Workshop plans which address the learning goals of the 2013 curriculum written and collated. Can be shared, or traded.</li> </ul>
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**Summary plan of action**

- To support the development of Ocean Maths style Parent-child Mathematics workshops and the use of family friendly home learning activities at 9 schools who are part of HTSA, 6 starting in September 2017, and 3 more joining later. Each school will provide Ocean Maths workshops for all classes in one year group in this initial phase, (phase 1). Each school would provide one workshop per term for all the children and all the parents of one year group. The workshops would last one hour and be followed by a 20 or 30 minute tea and cake session where parents would be invited to stay and talk informally about the workshops, maths and their school experience informally. This latter section of each workshop was to provide an opportunity to build parent –school relations in general and to make all parents feel welcome.
- To provide CPD, including demonstration workshops, shared workshops, network meetings and support materials for an Ocean Maths lead and all involved class teachers at each school spread out over 3 terms. To use this experience as the basis for developing next steps for each involved school as they continue providing / expanding their Parent Partnership in Maths strategies into Phase 2.
- To support each involved school in adapting and developing their approach to the workshops and their Parent Partnership in Maths strategies to best fit the needs of their schools, their children and their parents. It’s important to note here that the HTSA Ocean Maths project is meant to offer one model on which schools can build.
- To develop evaluation materials that can be used to measure the impact of the project and to provide information on which development can be built.
- To develop a series of new parent-child workshops and home learning activity booklets and games which better fit the conceptual ground embodies in the 2013 Mathematics curriculum, which can be used by any participating school and later shared or traded more widely.
- To begin, with the support of participating schools, to develop a CPD package around developing parent partnership in Mathematics which can be shared, and/or traded more widely.

**Initial timescale**

- Phase 1 initially to be complete by July 2017
- Phase 2 ongoing until September 2018 onward.

**Initial resource allocation (human, material and financial)**

- Funding for this project was sought and obtained from the Ocean Maths Legacy Trust. The funding covered 36 days of support and development time for the Ocean Maths project lead and a small materials budget for Kingsmead School to support the work.

- The Ocean Maths Legacy Trust also provided 450 children’s home maths resource packs and a range of copies of their original home learning materials copyright free.
- Participating schools received for no charge, on average 3 days of training and support time each, balanced between planning and set up meetings, resource design, network meetings, demonstration workshops planned and part resourced by the Ocean Maths project leader, shared workshops jointly planned and resourced and observations of their third workshops which trained staff were to plan and resource independently.
- Participating schools signed a Memorandum of Understanding agreeing to, among other things, organise, support and give staff sufficient time to be fully involved with all aspects of the workshops, and to do all they could to advertise the workshops and recruit parents. Schools also committed to involvement in Phase 2 of the project where they would carry on providing workshops, perhaps expanding to other year groups and later, perhaps supporting another school in their development of parent partnership in Maths.

### **Progress and Impact Review: April 2018**

#### **Visible Actions completed**

##### **Phase 1**

- All 9 schools have been recruited and have received materials and support from Kingsmead’s Ocean Maths Project Lead.
- All 9 schools have now run at least 2 workshops and are now running Ocean Maths style parent partnership events independently or are approaching independence.
- Project guidance, trackers, advertisement and evaluation materials have been developed in distributed
- New workshops and home learning materials have been developed. More home learning materials are in development
- 5 out of the 6 schools who started Ocean Maths in September 2016 have continued to run the project in the second year, with some now providing the workshops for 2 year groups.
- End of phase 1 network meetings with the initial 6 schools have been completed, action plans discussed and feedback from schools collated
- Around 300 parent questionnaires have been collected and analysed. Some were baseline questionnaires asking parents about their experiences of learning mathematics and their view of parental involvement at their schools
- Around 200 questionnaires from children have also been collated and analysed.

#### **Outcomes to date (*refer to data, intended outcomes and success criteria*)**

- 9 schools, 8 primary schools, and one secondary school have been involved with the project. This comprises 21 classes, 36 teachers, around 600 pupils and arounds 370 parents.
- 8 schools ran a total of 42 parent-child workshops between September 2016 and July 2017.
- 30 teachers including 6 Ocean Maths School lead teachers have now been given CPD in Ocean Maths and are able to plan, deliver and manage parent partnership workshops.
- 5 of the 6 schools who started in September 2016 have continued with Ocean Maths style parent partnership

in Maths into the second year despite pressures on time and budget.

- Most schools have developed their version of the Ocean Maths workshops to better suit the needs of their schools, pupils and parents. Millfields School now run 'Millfields Maths' workshops. William Pattern School focus on the reasoning and problem solving curriculum aims in their workshops. Jubilee School now focus on Year one to develop parent partnership earlier. Harrington Hill and Mandeville Schools are now running the workshops in two year groups.
- Benthall and Rushmore schools, which had to delay further involvement after starting in Spring term 2017, have now reengaged and are rapidly progressing to running the workshops independently.
- Stormont House Secondary Special School have now run two workshops with their year 7 group and their parents and are ready to run the next workshop independently.
- 12 new workshop planned have been developed and written up covering a range of topics from multiplication and division using arrays (for year 2 and Year 3 classes), several varied place value sessions, learning and using number bonds, money (a real opportunity) and telling the time.
- 4 new homework activities booklets have been developed and trialled. More are in development.
- A putative CPD package is now in development. The CPD methodology of the project has proved reasonably effective. Many teachers are now confident and experienced enough to plan and run workshops independently, and schools now ready to develop parent partnership in Maths in their own way, to suit the needs of their pupils and their situation. Some experienced OM teachers are now passing it on to others. We will continue to develop a CPD package in Developing Parent Partnership in Mathematics throughout this academic year with the intention to offer this as a traded service from September 2018
- Breaking new ground: Ocean Maths at Stormont House Secondary Special School. Stormont house is to my knowledge the first setting of its type to take on the Ocean Maths approach. This has particular challenges in terms of designing a workshop that includes everyone, while providing enough surprise and challenge for all the students. It also presents the challenge of persuading and supporting the parents of students who are often bussed in for far and wide to attend. Our first workshop there was a real success with 16 of 22 possible families represented. The second workshop had fewer parents present, but worked well for the students.

### Analysis

- Parent's and children's feedback on the workshops via questionnaires, focus groups and has been overwhelmingly, if not universally, positive. Using a 1 to 5 Lickert scale parents' average satisfaction score at 4.3 out of 5. Children reported very much enjoying having their parents work alongside them in learning Maths together, especially when the activities involved investigations, open ended – low threshold-high ceiling activities and mathematical strategy games. Competitive games were similarly enjoyed by children and parents alike. Parents reported really enjoying working with their children in the workshops, being surprised at how hands on Mathematics learning was these days and being surprised at the high levels their children were learning at in the 2013 curriculum environment. Most parents and children reported really enjoying the lively, energetic and fun nature of the sessions, although one or two involved teachers found loud sessions a little chaotic for them. Several parents were delighted with their children's engagement and success on the day.

"My son said that this was the best Maths lesson ever. He finds Maths really hard to learn and worries about it. He really enjoyed building numbers with the straws with me and by the end was talking about 10's and 1's lots. He liked the higher or lower game too. We'll be doing this stuff at home."

Parent, Millfields School

- Not all parent feedback was positive. Some parents felt that the workshop they attended was not challenging enough for their particular child; that the work was too easy for their child. This revealed in some clarity the different expectations that different individual parents and different groups of parents can have, and how these variations need to be accommodated in order to run a successful workshop.
- Often, only a few parents stayed behind after workshops to share tea and cakes and discuss their and their children's responses workshops, what they wanted from future workshops and engagement with the school, and of course their children. However, those who did not only talked to staff, but also to each other. The informality of the situation seemed to support parents in asking the questions they wanted answers for. Not all schools provided a member of staff to be present at this part of the sessions. School's staff have a multitude of jobs to do and they all pull against the time being available for quality two way interaction with parents. If we are to build parent involvement; to inform and support parents so they can in turn support their children's learning, then some more informal section of workshops and events could be very useful.
- I witnessed some excellent workshops presented by staff at the various schools that modelled Mathematical conceptual development extremely well and were engaging and helpful to children and parents alike. Teachers in general did better workshops, more fitted to their children as they went on.
- One very important measure of the success of any parent partnership programme would have to be the level of parent attendance at the events. Another would be how well the project recruited the involvement of all parents, especially those often thought to be hard to reach. Attendance at the workshops at every school varied greatly, from 26 out of 30 families attending a workshop at Jubilee School and 48 out of 60 at Benthal School, to 5 out of 30 at one workshop held at Millfields School. On average about half of the families in each year group was represented at any particular workshop. Schools who made the most effort to inform and recruit parents tended to enjoy better attendance, but that was not the only issue. For working parents, timing is crucial, and 'good' times varied at different schools and in different terms. The timing of workshops was also crucial. For Autumn term, workshops offered either side of half term tended to be well attended as was late February, early march and Early June. Schools who held workshops at the end of Term 3 often had fewer parents attend. One other important factor was the proximity of a workshop to other school events. Also, many schools found parents who have a habit of limited-engagement were less likely to attend workshops. Indeed, persuading parents to attend and forming the habit of attendance at regular workshops seems to be the greatest challenge

#### **Evaluation:**

##### **What went well**

- The HTSA Ocean Maths project has in many ways been successful. Large numbers of parents have had the opportunity to learn about the Maths their children are learning and how they learn it these days alongside their children. According to parent's responses via questionnaires, informal discussion and ad hoc talk groups, they have by and large found this very useful, and enjoyable. The children too have enjoyed working alongside their parents. Teachers have had the opportunity to discuss the ins and outs of planning and running workshops for parents and have had the opportunity to develop their expertise and confidence to the point where they can run successful workshops themselves. Schools have had the opportunity to try this ambitious approach, and many have adapted it in their own way. The Ocean Maths approach has the potential of bring many parents together in a situation where myths around the complexity and dryness of Mathematics can be broken down, as they observe their children enjoying learning Maths in a hands on and exciting way. The activities give as take home work at these workshops can lead parents to do Maths at home more and more effectively. It can and does bring parents into close proximity with the nitty gritty of learning in schools, and on a regular basis, and it can provide a relaxed space in which parents can have some input into how their experience of working with the school is shaped.

##### **Even better if ...**

- The project was not a complete success. Parent attendance at some school's workshops was a real issue. Sometimes only a handful of parents turned up, which made the workshops much more difficult to run well. There was a strong link between attendance and factors like how much energy school's put into recruiting

parents, and importantly on timing. If schools are to make real progress in involving parents in children's learning in Maths, then they need to commit to the process, whatever strategies they use. Schools need to commit time, effort and creativity to informing and recruiting parents, by every possible means. Also, in order to ensure a high status among school staff, and therefore the efficacy of any parent partnership project, the school's Head teacher and senior management team need to be seen to driving such projects an essential part of developing the school's wider curriculum. This includes in some cases providing direct leadership

#### **If I had my time again ...**

- All involved schools received children's home Maths packs, copies of Ocean Maths home learning activity booklets, and around 2 days of the project leader's time in terms of meetings, running workshops and supporting staff for no cost. The schools commitment as outlined in the MoU they signed up to (appendix 1) included: adequately staffing the workshops, engaging wholeheartedly in recruiting parents, running 3 workshops for each involved class in their first year, and providing adequate set up time and space for the workshops to be effective. Most schools did all they could in all areas. Some went to huge lengths and provided wonderful experiences for parents and children alike. Not all schools in the end met all the commitments. In hindsight, more time needed to be spent readying schools to make the most of the project. Meetings with Head teachers and their lead teachers could have set the tone and expectations more clearly, as could planning dates for all the year's workshops before we started anything else.
- One expectation of the participating schools was that their lead teachers for the project should attend termly meetings to share experiences and to plan for the future. It proved very difficult to find times when all leads could attend an after school meeting, and in the end we only had two meetings and not all leads attended despite being offered a choice of dates. The quality of discussion and planning at these meetings was very high and very helpful in terms of taking the project forward, but potential was lost because not everyone attended. In hindsight, this should have been made clearer as a commitment from the start and dates set before the project proper started.

#### **Engaging all the parents:**

- Given the changing demographic mix of parents and children at many of the schools in the area the difficulty delicacy of engaging all parents, not just those who by background tend to become involved in their children's schools is challenging. More confident parents can sometimes act as inclusive and supportive factors, but can also dominate conversations and expectations. If we are to reach those parents for whose positive children their engagement can have the most impact in terms of changing life chances, we need to be mindful of such dynamics. Including this awareness as part of the set up meetings may have been helpful to some schools and practitioners.

#### **What next?**

- The funding for this project was given to help develop a sustainable approach to parent partnership in Mathematics, therefore the involved HTSA schools and the project lead need to progress with the Phase 2 work of sustaining and growing parent partnership in Maths at their schools, developing a quality CPD package around Parent Partnership which can be shared or traded.
- Whole class parent-child Maths workshops are not the only model of Parent Partnership in Maths that schools could use. Schools in Singapore actively train parents there in the scope and methodology of their teaching of Mathematics. Small group workshops can also be very effective (see Every Child Counts Games@Home package: [everychildcounts@edgehill.ac.uk](mailto:everychildcounts@edgehill.ac.uk)). Fair Education Alliance (2017) report highlighted several successful focused approaches to engaging parents in the their child's mathematics learning including: drop-in lesson sessions (parents watching their child learning maths), work-shops to show parents how to support their child at home, and for parents of secondary students, workshops focusing on 'challenging' areas of maths or in one school providing City and Guilds courses and GCSE maths for parents.
- While the potential benefits of engaging parents in their children's learning in Mathematics are huge, evidence shows the centrality of parent engagement for better outcomes in children's short and long term learning and development. Ocean Maths and other participation in Maths will always be just one of a raft of parental engagement strategies. Part of sustaining this project needs to be about promoting that engagement with all



parents.

- Sustaining the project will involve developing and sustaining Parent partnership in Maths at all the schools who participated in Phase 1. In order to grow the project would involve devising an offer in terms of CPD and support which can be traded with other schools, including schools outside the HTSA. This would be best done with the involvement of more than one school and indeed the one person who has run the project. It would need to become something that the HTSA itself chose to offer.
- Schools interested in discussing Parent Partnership are more than welcome to contact us.

#### **Review of resource allocation (human, material and financial)**

- Of the original funding for this project enough is left to pay for 5 more days of the Ocean Maths Project Lead's time. 2 days are allocated to schools still developing towards independence, which leaves 3 more for the development of a CPD package and further resources.
- The greater numbers of classes and people supported and the extra time needed to re-establish Ocean Maths at the schools who had to discontinue, took time that was originally allocated for development work. All the involved schools received all their support time for free.

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- National Numeracy  
[:https://www.nationalnumeracy.org.uk/sites/default/files/the\\_impact\\_of\\_parental\\_involvement.pdf](https://www.nationalnumeracy.org.uk/sites/default/files/the_impact_of_parental_involvement.pdf)

Garry Minto May 2018

The following Appendices are available by contacting Garry Minto [GMinto@kingsmead.hackney.sch.uk](mailto:GMinto@kingsmead.hackney.sch.uk)

**Appendix 1:**

- Memorandum of Understanding between participating schools and Kingsmead School for the Ocean Maths project

**Appendix 2:**

- Example of Ocean Maths Workshop on Multiplication and division (Year 2)

**Appendix 3:**

- Example home learning activity for multiplication and division (Year2)

**Appendix 4**

- Workshop evaluation forms

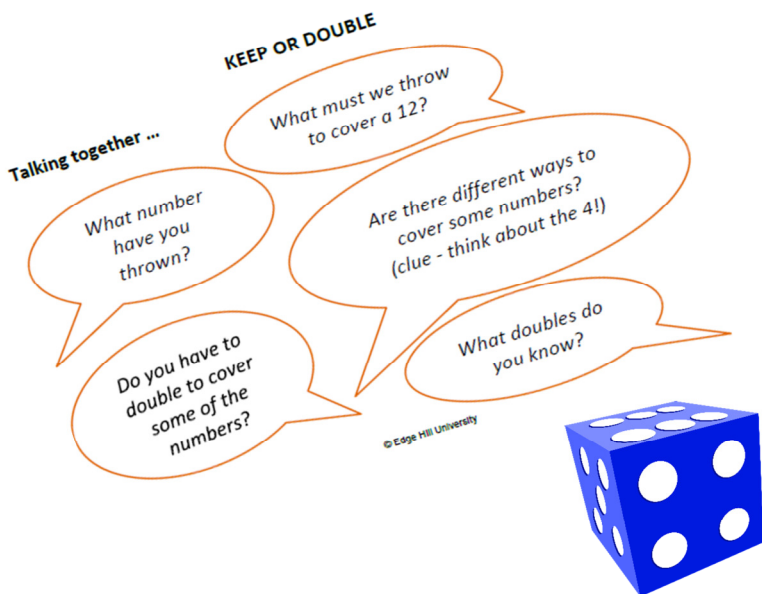
## Appendix 5 – some other strategies to develop Parent Partnership in Maths

- The 'What you say Counts' was launched in Wales 2014 and West Lothian in 2015 to raise awareness of numeracy and encourage adults to stop saying 'I can't do maths' in front of their children. Above is an example of their parent prompts. So how can we use the school notice board, banners to raise awareness of mathematics and to develop a positive image of mathematics both at home and at school

### Parent / carer prompts



### Games@Home: Keep or Double



2	10	6	8	4	12
8	12	10	4	2	6
6	2	8	10	12	4
12	4	10	2	8	10
10	8	4	6	10	2
4	6	2	8	12	10

Parent or parent child workshops modelling the use of family friendly mathematical games as home learning activities which promote number sense, knowledge practice and reasoning in an accessible and enjoyable way. For example, Games@Home from Every Child Counts at Edge Hill University: [everychildcounts@edgehill.ac.uk](mailto:everychildcounts@edgehill.ac.uk)

