

Maths Research 2016

Question- What impact does providing a mathematically rich environment have on children's development?

At Station house we have noticed that within our data, funded two year old children often had a lower amount of observations in maths than their peers and we were keen to readdress this imbalance. My manager and I felt this may be due to the level of understanding of adults and opportunities for mathematical play rather than what the children can actually do. So to help with this understanding I completed an online Maths course through the NDNA learning about how to provide different provisions for outdoor spaces and spoke in a staff meeting about my research and what I was planning to do so all the staff were aware. Stationhouse are also members of The World of Stuff, based in Weston-s-Mare and taking advantage of this we provided the children with an array of interesting real objects to help explore mathematical inquiries. We have also been developing the provision in the garden with more challenging equipment such as planks, tyres and homemade blocks which is influencing their play and encouraging more problem solving and mathematical risk taking! After a meeting with my manager we noticed there is a strong link between the child, teacher and environment so Stationhouse is keen to implement this throughout the nursery.

Ethics- By using consent forms I asked the parents' permission for their children to take part in this research. I used sensitivity towards the children and didn't force them to do any activities they didn't want to. I informed my manager and spoke about the research in a staff meeting to inform all the staff and told them my question.

Methods-My methods were to increase the amount of numbers visible to the children on a daily basis by making and buying numbers to be put in the garden and in the rooms.

I also observed the children's play and set up maths activities based on their interests

I increased the mathematical language I was using

I made an audit of the environment to see where improvement was needed

Involved the team as much as I could, creating a key words list for everyone to use with the children to introduce the children to a different variety of mathematical language

Research different forms of maths on Pinterest and through books and other interest groups

Using real maths resources e.g. calculators, tape measures, rulers, shoe measurers, measuring cups and spoons.

Findings- At one point I became focused on numbers and put them everywhere and noticed that this was more and less successful in different places- numbers on the fence were irrelevant to the children but the numbers on the stairs inspired lots of counting especially with children and their parents. I have extended this with questions to challenge the children and parents even more.

At first I found it a little tricky to focus the activities on just the focus group as the new resources and inspiration attracted a lot of children to the activities but to overcome this I asked the team to help and asked them to make note on what the children were doing. This in turn helped to inspire the team to think about mathematics.

When I let the children use their ideas and show me their thinking they were more engaged and used things in interesting ways- measuring stick, which initially I thought would be used to measure how tall they were ended up being used for walking across and balancing on and they were using the numbers to count their steps and engaging mathematically in their own way.

Providing diaries inspired one of the children to circle the numbers on the calendars.

Calculators were used as mobile phones to talk to their parents.

Using books to engage the children in maths worked really well and started a huge interest in measuring. They measured themselves as well as different parts of their key worker e.g. legs and feet! They loved finding their numbers on the measuring tape and used lots of mathematical language while finding out which friend was taller.

Maths observations in the nursery have increased by nearly 50% which shows how the staff's awareness has improved

Parent's involvement in counting in the nursery (stairs) has increased through putting open opportunities for children and parents to engage together.

By letting the children calculate and problem solve by making their own decisions- how high is too high when climbing outside in the garden, allows the children to take their own risks and help them to become confident problem solvers. McLane (2003) supports this "a sense of possibility, as well as ownership, control and competence on the player".

Adult led activities can be unstimulating and irrelevant to children. But Co-constructed (Vygotsky 1978) encounters such as balls being rolled down the slide where me and the children made a number line to extend the distance of the ball was really rich compared with putting mirrored numbers by the chalk board for the children to mark make as they didn't see the relevance in this.

Some children found activities really challenging to engage with, but they would be really engaged with more physical problem solving in the garden.

Impact-Parents have been more aware of maths in the environment and encouraging their children to count the stairs in nursery

Observations have increased by nearly 50%

Quality of observations have improved

Children have been more engaged in numbers and risk taking in the garden.

The team are more aware of maths opportunities in the environment.

Increased amount of measuring and calculating equipment available for the children to use.

Reflecting-Since starting this research I have noticed that it's not all about buying everything so that the children have it all. It's also about the little things that are free for example being able to take them out for walks to make collections of natural items. Children love to be outdoors and can learn lots of maths through the natural environment, from counting the steps they take to looking at the different shapes of leaves on the trees! Our children love to take risks and build lots of different structures to climb on and hide in and have also done lots of planting of broad beans.

I found that when I gave children the freedom to do what they wanted they naturally incorporated maths into their play but when there are heavily adult led activities I found that this often stopped the children's thought process or they would do something different.

Because I was more aware of the potential of maths in their play I was better equipped to scaffold a deeper level of learning by providing relevant resources and felt more confident to co-construct ideas with the children without taking over!