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Research question

By facilitating communication and sharing practice between parents/carers and school, can we reduce the anxiety that sometimes surrounds Maths?

For nursery age children can we encourage a more comprehensive 'hands on' approach to Maths that makes this area of development positive and accessible, rather than becoming too formal too quickly?

Background

At Montessori we have observed that parents often feel anxious about Maths, and also have a limited view of it, primarily around counting. Children themselves often perceive 'tasks' they feel they have to succeed in such as counting and getting it 'right'. Instead Maths can be seen as part of everyday experience and very much a part of what children are interested in, eg. Questions they ask such as: Are there enough for me to have one? How tall am I? Which one is bigger? Does it fit?

By sharing with parents/carers, we hope to communicate the many opportunities for mathematical thinking that are in everyday experiences and how these real experiences help lay the foundation for understanding abstract concepts later on.

We want to facilitate parents/carers sharing with each other activities they do at home that they feel works well from a 'Maths' point of view, and we want to give opportunities for any discussions and questions that arise.

Method

We held an open evening for parents/carers on how we facilitate areas of Maths in the setting, including number; size, shape and measure, and also how daily experiences of sorting, laying a table, food preparation etc. lay foundations for Maths.

We gave out feedback forms from the evening, and later a questionnaire to all parents/carers on their attitude to Maths, ideas that they could share, and what they would like to have included in a Maths booklet.

A booklet entitled 'Maths in the Home' was prepared based on their responses, and given out to all parents. This was followed by a request for feedback.

Making Maths positive and accessible for young children.

Our research project started with an awareness of the anxiety which often surrounds Maths, both by parents and children - we observed that this anxiety can sometimes lead to Maths being presented in too formal a way too quickly, children being 'tested' by their parents, and a narrow view of seeing Maths as limited to number and counting.

Through our project we aimed to engage with parents and carers and share our approach to Maths. We invited parents and carers to share in return: how they feel about Maths, and how they engage in activities with a mathematical content at home. Our aim was to convey that Maths for

young children is positive and accessible and part of everyday experience. We wanted to encourage a 'hands on' approach to Maths that makes Maths relevant and stops it from becoming too formal too soon.

This approach is in keeping with our Montessori philosophy which emphasises that children need concrete experiences as the base from which they build abstract concepts.

Our methods for engaging with parents/carers involved an open evening, a questionnaire, a booklet that we gave to all parents/ carers, informal conversations and feedback forms for both the open evening and Maths booklet.

Our research started with an open evening for parents/carers to share our approach to Maths. The parents/carers could explore the classrooms and use the materials. We put a description by each activity to highlight the mathematical content. Some activities were directly mathematical such as exploring the balance scales, and others were everyday activities which none the less provide indirect preparation for mathematical thinking, such as cutting up fruit for the snack table.



An example of an activity with food that involves mathematical thinking eg. one to one correspondence

An example of a description to highlight how everyday activities have mathematical content.

Cooking and Food Activities

These activities provide many opportunities for concrete mathematical experiences. Chopping up fruit and vegetables entails dividing a whole into a number of parts. Following recipes and baking involves weighing out ingredients, counting the number of (for example) eggs/cake cases, measuring the volume of a liquid, oven temperature and how long it takes for something to cook. The concept of shape abounds in food activities, such as; rolling out pizza dough to make a bigger flatter circle, cutting carrots into circular pieces or long straight strips and all the wonderful irregular shapes of fruit and vegetables.

Then there is the question of quantity and number; how many are there? Have we got enough? How many slices of pizza do we need?

At home children can be involved in food/cooking activities and often the adult's role is to supply the language, to 'narrate' the activity; 'we need 350 mls of water' '500 grammes of flour, that feels heavy' - not expecting the child to immediately grasp the mathematical concepts involved, but drawing their attention to these concepts and letting them have a hands-on experience of them.

Seven families came to the open evening out of a total of fifty families attending Montessori. We gave out feedback forms which they all completed. These showed a very positive response to the open evening, and indeed during the evening itself the parents appeared very interested and engaged and there were many questions and conversations. However, we knew that not everyone would be able to attend an open evening, so the next part of our research was to try and reach all families.

We wanted to do this through a booklet about Maths which we would give to everyone. First we wanted some information from parents, hence the questionnaire. We wanted to find out how parents/carers feel about Maths, both in attitude and competence, and what they would find useful in a booklet. We also asked them to note any activities they engage in at home that they would like to share with other families. We did not want the booklet to just be our ideas, but to be a two way sharing process.

The questionnaire was very helpful. We had 24 responses and people answered the 5 questions in detail, providing us with valuable insight into their own feelings/attitudes, how they engaged with their children at home about Maths and what they would find useful in a booklet.

The responses demonstrated very different attitudes towards Maths. As a traditional school subject, Maths frequently has negative associations. People often feel they are in one of two camps; either they can 'do' Maths and enjoy it, or Maths is a difficult subject which they feel they fail in. The replies we received very clearly showed this split of feeling and attitude. Some examples are;

"Maths was probably my least favourite subject to be honest!"

"At school Maths was taught in a very dry, boring way"

"I was never keen on Maths at school and was in the bottom set"

"Neither of us have ever felt very comfortable with Maths"

"I am not confident when it comes to Maths. I find it quite intimidating as I'm not very good at it".

And.....

"I think we're both pretty confident and both enjoyed Maths at school. Both of our jobs involve Maths to some extent".

"We are both very Maths orientated - both use Maths in our work and enjoy the subject".

"Maths was my favourite subject at school. We are both engineers and Maths is an essential part of our jobs.

"I enjoy Maths very much and have always done. I am a computer scientist and programmer so Maths is at the core of my work".

As well as sharing their attitudes towards Maths, parents/carers also shared activities they engage in at home with their children that had some mathematical content.

Some examples are:

Counting towards an event; 'how many sleeps', counting stairs, counting food items

Observing numbers on a digital clock, numbers on calendars

Dividing food so as to be fair, cooking activities

Counting snails and woodlice in the garden/park, playing board games with dice

A building site in the garden, filling and emptying buckets.

Counting down to get ready to go out.

From the responses we also had a long list of what parents/carers wanted in a booklet.

To summarise, they said they would find it useful to have:

Indications of what children could be expected to be doing/understanding at what age,
Ideas for activities
Words of number songs/rhymes,
Ideas for extending children's mathematical thinking and how to introduce addition/ subtraction
How to engage children who did not appear to be interested in any 'activities', especially children who liked to be outside and very physical.

This was quite a challenge! However, we compiled a booklet aiming to meet these requests and included in it a list of ideas for activities that had come from the parents/carers themselves to facilitate a sharing between parents/carers of their own 'best practice'.

A few weeks after all the booklets had been given out we sent out a small feedback form to all parents/carers to ask how useful they had found the booklet.
All the responses we have had so far have been very positive, the booklet being rated 4 or 5 in terms of usefulness (5 being the highest possible score and 1 the lowest).

Some examples of the feedback are;

"I would grade it 5 - very helpful, because the ideas were clearly expressed, and made me think about Maths in a broader way."

"We would score the booklet a 5. It contains so much information and ideas and we have already applied many to our daily activities."

"We found the booklet really helpful and informative, with simple and clear tips which we are already applying at home. It is really good to receive such a sort of informative material, we really appreciate it. Therefore we rate it 5."

"I found it helpful because it gives ideas of how to use Maths in everyday situations and make it part of life and learning. I believe that children learn better when they can relate concepts to their own life and experience."

Conclusion

From the parents/carers willingness to share through their responses to the questionnaire, and their positive response to the booklet, we feel this project has been very worthwhile. Parents/carers have shared with each other what works well for them at home. They have shared with us their personal attitudes towards Maths and have asked many questions which we were/are able to discuss through the booklet and conversations. Although only a small number attended the open evening we now have the resources to be able to offer a similar event again. As a result of undertaking this project we are more aware of - and constantly looking for - the Maths in everyday experiences. If we are more aware of this ourselves, then we are going to be better able to draw children's attention to the Maths that is in everyday life.