

# **What time of day is children's learning more effective?**

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## **Rationale**

Learning and teaching in maths, I have found to be one of the most challenging areas of my first year of teaching. I have found difficulties with engaging children in maths especially when exploring more difficult concepts. Keeping children focused throughout a whole maths lesson has also been a key focus throughout my year of teaching. For this reason, investigating the possible impact that time of day has on children's learning in maths appealed to me professionally.

Hartley and Nicholls (2008) discuss that every person is an individual and therefore has their own individual skills and qualities. For some this can be how efficiently you engage at different parts of the day. In an education setting this can therefore have an effect on learning outcomes in different areas of the curriculum depending on what time of day they are taught. This idea, supported by Klein (2001) highlights that time of day has an impact on learning has been explored since the mid 1920's. As research further developed throughout the years this theory became much more scientific and related more strongly to human biology, with the changes of hormone levels throughout the day. Such biochemical changes throughout the body during the course of the day, express themselves in a humans' daily functions and their ability to learn new skills and recall information. Research found that the left hemisphere of the human brain is more active and powerful in the morning hours, which helps people to process information and carry out routines and procedures. Such skills and ideas are more closely linked with maths concepts. It could be argued that literacy activities such as spelling would also be effective at this time of day, due to the area of the brain that the child is using.

## **Aims**

The main aims of this enquiry are to investigate

- The impact that learning in maths at different times of the day has on children's understanding.
- Is learning more effective at specific point in the day.

## **Methodology**

Three different maths lessons have been carried out. One lesson was carried out before playtime, one between playtime and lunchtime and the final lesson was carried out from 1pm until 2pm. All three of the lessons focused on data handling, specifically focussing on median, mode, mean and range. Each lesson focused on a different aspect of this topic.

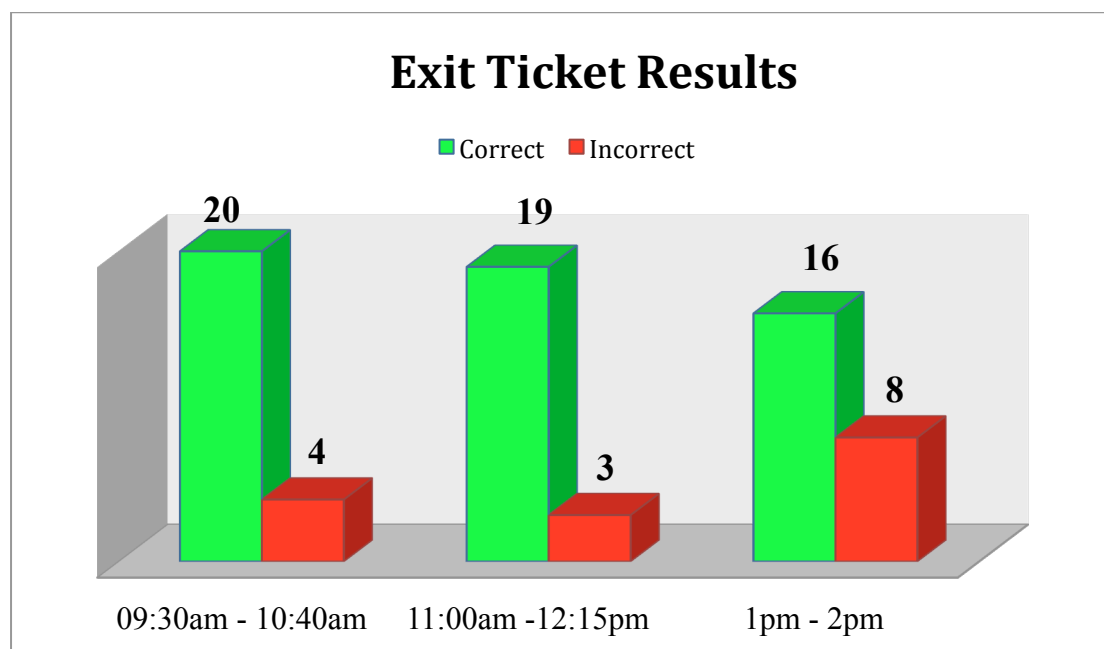
Exit tickets have been used as a way of assessing the children's understanding at the end of each of these lessons, to help to assess the impact the lesson had on the child's knowledge and understanding. With the results from all three lessons being used to compare the impact of the different times of day.

Observations have also been carried out during the lessons to help me gather evidence. Carrying out these informal observations has helped me when analysing the data gathered. The observations have been used to monitor any change in the children's attitude towards learning and various different times of the day and also noting changes in engagement levels.

Questionnaires have also been used to gather information on what section of the day children prefer to participate in maths. This data has then been used to compare child preference with achievements in learning at various different points of the day.

## Findings

### Whole Class Findings



The graph above shows the findings of the exit tickets collected over the three data handling lessons. The green bar represents the number of children that completed the exit ticket and found the correct answer with the red column representing the children who answered the exit ticket with an incorrect answer. It should be noted that one child was off when the data was collected from the lesson, taking place from 11:00am until 12:15pm.

The results above clearly show that the majority of the children gave correct answers in the two morning sessions compared to the afternoon session. These results reflect the argument put forward suggesting that children perform better in maths in the morning due to brain activity supporting short-term memory and recall processes.\

### Observations

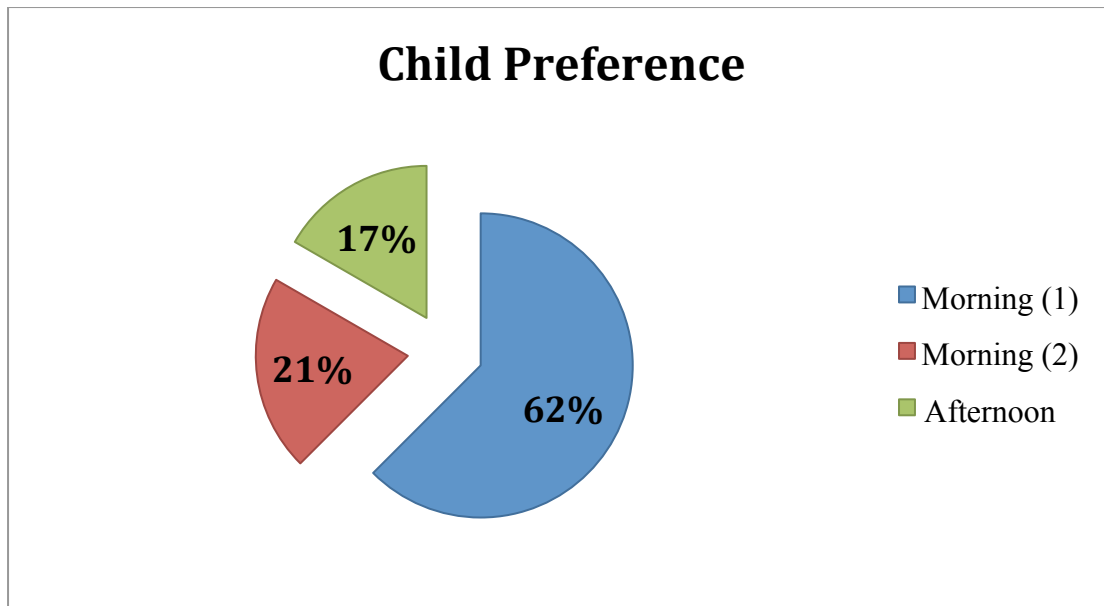
Morning Observations: During the first morning session of maths all of the children settled quickly. The children responded well to mental maths tasks and appeared to be able to follow instructions more clearly throughout the lesson compared to lessons carried out later in the day. All of the children were accepting and willing to take part in the activities, practical and written. This increased engagement could be argued to be an active influence on the children's performance and understanding of the concept being explored. Throughout the morning observation I did note that some children appeared to be lethargic. Small underlying behaviour was dealt with during this session such as talking, however I found that conversations appeared to be task related.

Mid-morning Observation: Throughout the observation I did observe positive engagement with the tasks and the children worked quietly and very independently. During direct teaching time the children listened well. I also felt that during this time there was an increase in the number of questions and level of discussion about the learning. This suggests that the children at this time were engaged with what they were learning about and were able to ask questions to consolidate their understanding – all beneficial to overall performance and understanding of an idea.

Afternoon Observation: The majority of the children listened well throughout this lesson however I did note that I had to repeat instructions and expectations a lot more. The children did listen however were not as inquisitive or independent in taking in new information or ideas about a concept. Throughout this session, behaviour was much more of an issue with children becoming much more distracted with objects on tables or people around them. Dealing with such interruptions can only negatively impact on the learning taking place within the classroom. When questioning the children, the responses were a lot more limited and recapping on previous learning was not as quick and effective. Recall of information appeared to be more challenging during this session

## **Questionnaires**

The data displayed in the pie chart below shows the time of day that the children in class prefer to take part in maths. The children were asked to think about the three different maths lessons and decide when they thought they performed the best. The results above indicate that the majority of the children prefer to take part in maths first thing in the morning, with their second preferred choice being after playtime. Fewer children, if given the choice would choose to participate in maths after lunchtime.



## Conclusions

It can be concluded from the data collected from this small-scale enquiry that not only do children appear to engage with maths more in the morning session of a school day but also they are more successful in achieving the intended learning target. Children have also identified that they too feel that they perform better in maths in the morning sessions rather than the afternoon. Although research can support these findings it is also important to take into consider other outside influences that may affect a child's performance such as social and home life. Has the child had enough sleep the night before? Have they had breakfast? Are there any other issues happening outside of the child's academic life? All of these possible influences should be considered and play a part in a child's engagement and learning.

## Implications for Future Practice

Practitioners should always be reflective in their practice and in how they plan for the children in their class. One way in which this could be done is through taking child preference into consideration when planning a class timetable. Although this is not always possible I have tried to adapt my timetable to plan for and carry out maths activities as much as possible in the morning slots.

Knowing the children in your class is also extremely important in helping to structure lessons, which help to engage children even when maths has to be taught in the afternoon. Information gathered through this small-scale research project found that children did find it more challenging to take on board new concepts and ideas in the afternoons. For this reason it may be more beneficial to use afternoon maths sessions to complete activities and carry on learning already taught in previous lessons. Using a more active approach to maths or outdoor learning with maths also may help to boost engagement and learning in these sessions. Measuring the impact of such an

approach is something that would have been investigated further through future research.

Exit tickets have proven to be very effective throughout this research project in focussing the children in on what they have been learning and assessing the basic skills of this concept. Asking one simple question at the end of the lesson helps to identify quickly and easily who has grasped the concept and who may require more help or support. Taking part in this activity also allows the children to be reflective in their own learning.

### **Bibliography**

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