

HOW I TEACH MEASUREMENT: LENGTH

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I would like to talk about how I teach measurement (length) by consolidating conceptual knowledge around concepts like length and breadth/width and also giving the children practical activities to do to cement their understanding. The children often do not know what 'estimate' means. They tend to struggle when it comes to using non-standard and standard units to measure. For example, when asked to use a pencil to measure their height, they have no idea how to use the pencil and keep a finger on the end and then move the pencil down. It seems they have not had enough opportunities to measure using non-standard and standard measures, alternatively they had not picked up what to do in the classroom when their class teacher did measurement. This happens when the children are weak and take time to pick up new concepts.

INTRODUCTION

I would like to talk about how I experienced teaching length to children attending learning support in the Foundation Phase. I am a learning support mathematics teacher who teaches the weakest of the weakest in our school. I take groups of 4, or 5 or 6 children at a time for 50 minutes and they attend my classes twice a week. Our children come into the school at Grade R level and most are isiXhosa or Afrikaans speaking. However, the LOLT (Language of Learning and Teaching) of the school is English and the learners are immediately immersed in an English environment. Naturally there are problems when we come to teach mathematics as the children have to learn the vocabulary and concepts of mathematics in a second language. I teach Grade 1 to Grade 4 remedial mathematics.

UNDERSTANDING DISTANCE CONCEPTS

Last year I taught length for about 3 weeks. The first thing I noticed was that the children did not know simple concepts like length, breadth/width, taller, shorter and estimate. I used the door mat in the classroom and we pretended that it was a swimming pool. Most of the children had been to a pool. Then I asked the question: "When you swim from here to here, what do we call this distance?" They replied "We swim the length of the pool".

We then discussed length and breadth/width. The children went into the passage outside my classroom. “Let’s walk the length of the passage,” I said. In this way they came to understand basic language necessary for measuring length.

We are required to first estimate and then measure but the children did not know what ‘estimate’ meant. One child said it was ‘guess’ and so I taught them to first guess/estimate how many measures they would use and then they would measure with a stick, or a body part or ruler or tape measure. The secret was to keep the activities practical and use the environment around them to talk about conceptual language. In other words, I used hands on activities and concrete materials. We went out into the passage and used paces to measure the length and breadth of the passage.

It was identified that children had difficulties understanding the concept of starting from a fixed point when dealing with length (O’Keefe and Bobis, 2008). Another difficulty was that children struggled with the concept of leaving no gaps between units of measurement. When using rulers they sometimes were confused with inches and centimetres on the different sides of the ruler. And where to start? Many began at the end of the ruler and not at the 0. For example when measuring their height with a pencil, they did not realise that they had to start with the pencil point and finish with the eraser and then put the point under the eraser. They were not aware of the importance of accuracy and did not realise that a single unit is an exact repeat of the next unit. I am sure they were taught by their teachers, but they obviously had not had enough practice. I had to show them individually how to measure using a pencil or using a ruler or tape measure. However, they did improve over the period of three weeks and eventually could measure more accurately.

LESSON INTRODUCTION

How did I introduce the lesson? I told a story about a cave family (and made it exciting while telling them that Daddy went hunting and Mommy went to gather nuts and roots). Big Daddy decided one day to move out of their cave and build a house. But what could he use to measure the sides and foundation of his house? The children mentioned body parts and we began to measure using body parts. They mentioned sticks and stones and we measured using sticks. In Grade 2 after using non-standard measures, I introduced the metre.

We did not have a metre stick but I measured metres using wool and allowed them to measure metres using the wool. In Grade 3 I revised metres and also introduced centimetres.

By walking the length of the passage outside the classroom, they eventually came to a rudimentary understanding of metres. I gave them worksheets to complete where they had to estimate and then measure using the wool (1 metre per piece of wool) and the ruler. When I tested the Grade 4 class recently (this year), they were unable to tell me which was bigger – a centimetre or a metre, a metre or a kilometre. Last year we spoke about the distance from the school to the Hypermarket and it was approximately one kilometre. This means they still have not grasped the concept of how long a metre or km or centimetre is. They really do need a lot of practice in order to understand the basic units of measurement.

Because I have small classes, I was able to assist these children to measure accurately. After three weeks (two periods per week) they still had not fully grasped all the vocabulary and concepts needed to prepare them for Grade 4. Our children at our school will need further help in this area. According to the systemic test results, measurement is the one outcome which is most neglected and needs mastery. I believe we need to therefore spend a longer time consolidating measurement in the Foundation Phase.

ENRICHMENT

For fun, and to use more practical activities, what about giving the children a bean to plant and after a couple of weeks allow them to measure the length of the stem? For extension get them to estimate how far it is around the school and take them for a walk and use a trundle wheel to measure how many metres? As I mentioned, our school is approximately 1 km from the Hypermarket. If you have the opportunity to walk to a place like this take the children and tell them they have walked 1 km. Also ask the children what unit of measurement they would use to measure a pencil, the width of the classroom, the length of the passage. This was also identified as a stumbling block in my class. After some practice, the children still did not know which standard unit was to be used to measure different lengths.

CONCLUSION

In conclusion, it seems that children in the Foundation Phase need to spend more time on mastering length. This is especially at our school where the children do not learn in their mother tongue. Concepts like 'length', 'breadth' and 'estimate' need to be mastered before the children can begin to measure. And learners need to learn to measure accurately.

REFERENCES:

O'Keefe, M and Bobis, J. (2008). *Primary teacher's perceptions of their knowledge and understanding of measurement. Proceedings of the 31st Annual Conference of the Mathematics Research Group of Australasia.*