

1. Measurement in Context

Summary: Young students often struggle with conceptual understanding of measurement, even something relatively straightforward like length. In an article for the *Mathematics Education Research Journal*, two Australian professors write about the importance of tying together measurement and students' personal experiences in order to build conceptual comprehension.

Practical Applications

The authors focused their study on kindergarteners by giving students the same open-ended task, six months apart, to draw a ruler and explain their drawing. There were several key findings:

- Students who displayed a high understanding of properties of measurement via how a ruler works (e.g. that it has ascending numbers that show increasing length; that the numbers occur at consistent intervals) were able to put their drawing in context of their lives. For instance, one student explained "I put some numbers. They help us find how long and how short things are. I've seen my Daddy use a long ruler before, to measure the door. He took the front flyscreen door out to put new gauze in. He had to measure it to see how much gauze to use." Many of these drawings showed not just a ruler but the student's drawing of him or herself measuring something with it.
- The majority of students who grew in their understanding of measurement over the six months also grew in the richness of real-life context they provided. The authors suggest, "This result may indicate that the more children can position a particular concept within a personalized context, the more sophisticated their understanding becomes."

The authors propose several classroom implications for teaching measurement:

- Give students open-ended tasks like "draw a ruler" or "draw a clock face" and having them explain the drawing as a way to assess their understanding on the matrix of content understanding and contextual understanding.
- Ask students to perform the same drawing/telling task at multiple points throughout the year to assess growth
- Provide chances and encourage students to make personal connections between measurement concepts and their lives
- If students have rich context to offer about a measurement concept, it may be possible to quickly push them to apply their knowledge (in other words, shortcutting the traditional method of starting with non-standard units and building up to actual measurements)

Conclusion and Citation

While it is common to seek real-world applications of math as an investment tool, this study suggests that helping students connect math and their personal lives actually enhances their academic performance, particularly in the realm of conceptual understanding.

Lowrie, T. & MacDonald, A. "Developing Measurement Concepts Within Context: Children's Representations of Length." *Mathematics Education Research Journal*, April 2011. <http://tinyurl.com/3o9bjbp> (free)