Math Webcast #4
Measurement

Viewing Guide
for Math Leaders

Key Points

- **Children are naturally interested in measurement.**
- **Measurement is connected to number and geometry, and it provides a foundation for math in middle and high school.**
- **Measurement is an important early childhood basic as evidenced by its inclusion in the Child Outcomes Framework, and national and state standards.**
- **Children must have experiences with measuring in order to develop the concepts needed to be able to measure.**

Part I: What do children need to know to understand measurement?

Conservation

What is the definition of conservation?

Why is it important for children to understand conservation?

How do we help children develop (understanding of? Or conceptual awareness of?) conservation?

Give an example of a perceptual clue.

Transitivity

What is transitivity?

How can we help children understand the concept of transitivity?

Unit

What is a Unit?

Why is it important that children understand units?

Part II: How do children learn measurement?

What should children learn?

How do we facilitate children's understanding of measurement**?**

Where do children learn measurement?

Give three examples of children involved in measurement, even if they are not consciously measuring.
1)

2)

3)

Give an example of a child demonstrating conservation of:

Area:

Number:
Volume:

How does the teacher intentionally plan for that learning?

What is the sequence that we should think of when we work with children on comparing things? What should they learn first?

How is a young child's strategy for measurement different from that of an older child?

Give three examples of how teaching staff can assess children's understanding of measurement during regular activities.

1)

2)

3)

How can teaching staff use this information to scaffold children's learning?

Part III: What else?

What is the definition of measurement?

Give an example of an opportunity for mathematizing related to measurement.

What is an attribute?

Why is it important for children to understand different attributes of things?

How could this understanding form the basis for later learning?

Give three examples of comparison vocabulary, and tell how you might 'mathematize' the comparison for each.

Why is it important for children to make progress in "Approaches to Learning"? What does this have to do with math learning?

Terms (in the order of introduction)

Measurement – assigning a number to a continuous quantity . . . 30 is assigned to describe how many centimeters a round a ball; 3 is assigned to a child's height in feet, and so on. Measurement embeds three important concepts: (1) conversation; (2) transitivity; and (3) unit.

Perceptual clues – what it looks like; through visual inspection (instead of actually measuring) a child makes judgments of sizes, quantities and amounts (measurements).

Perception – using "what it looks like" (perceptual clues) to make judgments rather than being informed by experience; initially children's measurement ideas use perception.

Conservation – an object maintains the same size if it is moved, changed in shape, or subdivided into parts.

Transitivity – when comparing two objects, children first understand direct comparisons of measurements on a measuring tool; then they learn to relate the measurement to an intermediate measure (an indirect measure).

Unit – a standard measurement that is equal-sized.

Inverse relationship – it takes <u>more</u> little cups to fill a large container and <u>fewer</u> big cups to fill the same container.

Attribute – a particular property of an object to be measured, e.g., length, width, weight, area, perimeter, circumference, capacity.