

Using M⁵ to Support Learning About Measurement

This handout provides specific examples for each practice in the M5 Early Math Approach to help educators support infants and toddlers in their understanding of measurement.

Mutual Learning

Observe children and incorporate their languages, cultures, abilities, and emerging concepts and skills into explorations related to measurement.

- **Notice how infants and toddlers demonstrate their knowledge and express interest in measurement. For example, children may show interest in**
 - ◊ stacking with different sized blocks or filling and emptying buckets, and
 - ◊ listening to a book about size comparisons.
- **Introduce vocabulary related to measurement in both English and the children's home languages.**
 - ◊ Children who are multilingual learners may understand or use some measurement vocabulary in their home languages, English, or both, and may benefit from visuals associated with the introduction of new vocabulary.
- **Learn about children's and families' interests and introduce objects that build on children's family, community, and cultural experiences.**
 - ◊ Share instruments that are culturally significant used in community celebrations, like small tambourines or drums that produce a variety of loud and quiet sounds.
 - ◊ Offer toy vehicles of different sizes, like buses, police cars, mail trucks, or grocery carts based on what children see in their neighborhood.
 - ◊ Encourage children to notice who is tallest and shortest in family photos they share from home.





Meaningful Investigations

Offer children opportunities to explore measurement through movement, hands-on manipulation, and problem-solving with a variety of objects.

- **Set up the environment to allow infants to move through space.**
 - ◊ Crawling, rolling, or even being carried builds an infant's understanding of distance.
 - ◊ Sitting in a box or crawling through objects like a tunnel helps infants explore concepts of size and volume.
- **Encourage exploration, comparisons, and problem-solving through hands-on manipulation and creative play.**
 - ◊ Give opportunities to play with different sized containers, such as measuring cups or spoons that children can stack, fill, pour, dump, and nest.
 - ◊ Provide children with large containers that they can fit inside, such as large cardboard boxes or plastic tubs. Invite them to explore which containers are too small, too big, and just the right size.
 - ◊ Offer blocks and other objects of varying sizes and weights that children can use to build. Prompt children to notice and compare the size or weight of various objects.
 - ◊ Explore different musical instruments, describing the sizes of the instruments or the volume of the sound.
- **Use prompts to invite children to solve problems and reason about measurements of objects.**
 - ◊ "The ball won't fit there because it is too big. What other ball might fit in there?"
 - ◊ "This cup is full. What happens if we pour some out?"
 - ◊ "How many blocks does it take to make a tower as tall as you?"





Materials and Learning Environment

Provide open-ended materials varying in size that children can use to stack, compare, fill, and empty.

- **Learn about children and families and offer safe materials that respond to their cultures, languages, interests, strengths, and areas for growth. Some age-appropriate materials for this age group may include the following:**
 - ◊ Materials of varying sizes and weights to be compared, such as blocks, balls, vehicles, and toy animals.
 - ◊ Items that can be stacked to explore size and length, such as cardboard boxes, containers, plastic jars, or other items from children's home lives.
 - ◊ Sensory tables filled with different-sized measuring cups, containers, and spoons that children can fill and empty with sand, water, pompom balls, or bubbles.
 - ◊ Provide different-sized make-believe objects such as animals, vehicles, dolls, and cookware to encourage use of measurement vocabulary.
- **Read books that discuss size relationships in children's home languages, English, or both. Some examples of books include the following:**
 - ◊ *Baby Goes to Market* (or *El bebé va al mercado* in Spanish) by Atinuke
 - ◊ *Cook It!* (or *A cocinar!* in Spanish) by Georgie Birkett
 - ◊ *Leaves to My Knees* (or *Hojas hasta las rodillas* in Spanish) by Ellen Mayer





Math Vocabulary and Discourse

Use measurement vocabulary during daily routines, interactions, and play by modeling how to compare objects of varying size, weight, speed, size, and volume. Encourage children to use words to compare quantities (for example, “big” and “small”) in their home languages, English, or both.

- **Model using measurement vocabulary and encourage children to use these words during daily routines, interactions, and play.**
 - ◊ “You have a little pancake on your plate!”
 - ◊ “It is hot outside today.”
 - ◊ “Your nap was short today.”
 - ◊ “How do you say small in Arabic?”
- **Encourage toddlers to compare the measurable attributes of objects using words such as “bigger,” “smaller,” “heavier,” “full,” and “empty” while exploring.**
 - ◊ “What can we put on this tower to make it taller?”
 - ◊ “Which car is the biggest, the red one or the blue one?”
 - ◊ “You made a short playdough snake. Let’s make a longer one now!”
 - ◊ “You poured lots of water into your cup. Now it is almost full!”
- **Ask questions that compare objects. After giving ample time for children to respond nonverbally or verbally, model how children may use measurement vocabulary to answer the question.**
 - ◊ “There is a blue ball and a red ball over there. Which one is closer to us? The blue ball is closer!”
 - ◊ “Which cup do you want? The red cup is smaller than the blue one.”
 - ◊ “What will happen if you add a block to your building? Your building is much taller now!”

Measurement Vocabulary

- Size: big, bigger, biggest, little, littler, littlest, small, smaller, smallest, long, longer, longest, short, shorter, shortest
- Volume: full, fuller, fullest, empty, emptier, emptiest
- Weight: heavy, heavier, heaviest, light, lighter, lightest
- Distance: near, far
- Temperature: freezing, cold, warm, hot, burning





Multiple Representations

Offer multiple ways for children to explore the measurable attributes of objects such as length, height, or volume.

- **Invite children to create and play using different materials to compare sizes.**
 - ◊ Line up a short row and a long row of toy cars.
 - ◊ Roll out short and long playdough snakes.
 - ◊ Offer short and long ribbons to touch, pull, and compare.
 - ◊ Roll balls down short and long ramps.
- **Provide children with alternative ways to explore measurement and express their knowledge. These alternatives can meet the needs of children with varying abilities.**
 - ◊ Encourage toddlers to use gestures (arms wide to signify big) and their bodies (dancing fast or slow) to show their knowledge about measurement.
 - ◊ Offer lightweight, easy-to-grasp objects in various sizes.
- **Provide multiple opportunities throughout the day for children to engage with the same concept by speaking about it, seeing it, and exploring it.**
 - ◊ Sort objects by size and talk about size during snack time.

