Preschool/TK/K

Answer Key for Observing M^5 in Action: Measurement

This handout provides sample responses that help facilitators discuss each of the M^5 teaching practices observed in the video clip. It includes questions that apply across ages. Use the questions that work best for the video you have chosen. The video clip may or may not include examples related to each question.

Video:

Comparing Length with Unit Blocks (3–5 years)

Comparing Length with Unit Blocks (3–5 years)- Audio Descriptive Version

In Part 1 of this video, a child compares the height of family members using unit cubes. In Part 2 of this video, a child and educator use unit cubes to measure and compare the lengths of their hands.

Mutual Learning

- What did (or might) the educator learn about each child during this experience?
- In what ways was the educator responsive to individual children? Consider children's interests, languages, cultures and lived experiences, abilities, and emerging skills and knowledge.

Some Possible Responses

- During this interaction, the educator observed the child's understanding of measurement concepts and vocabulary. For example, the educator noticed that the child was able to use words to describe length (such as short, tall).
- The educator also observed that the child was still developing her understanding of comparative vocabulary (such as shorter, shortest, tallest). When the educator showed the child three towers and asked, "Which one is the tallest?" the child pointed to the shortest tower. The educator responded to the child's emerging understanding of comparative vocabulary by clarifying the meaning of these words. "Shortest is small … longest means the tallest one." She paired gestures with her words to more clearly communicate their meaning.

- When the child showed interest in using the towers to represent the relative heights of her family members, the educator was responsive to this interest by asking, "So your daddy is this tall, your mommy is this tall, and you are?" By making connections to the child's family members in an authentic way, she built on the child's strengths (her knowledge of her family members' relative heights) and helped her work on areas where she needed support (understanding and using comparative language in English).
- Through this interaction, the educator learned about the child's understanding of measurement concepts and vocabulary. In addition, she learned about the child's family.

Meaningful Investigations

- In what ways was the experience based on children's questions, interests, or real-world situations?
- In what ways was the experience open-ended? How did this support children to experiment with different approaches to solving a problem or answering a question?
- In what ways did the educator support children's thinking and problem-solving related to measurement?

Some Possible Responses

- By providing open-ended materials like unit cubes, the educator allowed the child to take the lead in solving problems of interest to the child. When the child showed interest in using the towers to represent the relative heights of her family members, the educator supported the child's inquiries by asking questions such as, "Is Charlie younger than you? Smaller than you?"
- The educator supported child-led inquiry by asking "What else can we measure?" The educator then encouraged the child to make predictions, estimations, and comparisons. She challenged the child to use the unit cubes to measure and solve problems. "How long do you think your hand is? … From here to here, to the tip of this finger." To encourage the child to make predictions and estimations, she asked questions such as, "Do we need to add more?" and "How many more do you think we need?"

Materials and Learning Environment

- What did you notice about the materials and learning environment?
- In what ways did the materials and learning environment offer opportunities for children to engage in measurement?

Some Possible Responses

- The unit cubes are an example of an open-ended material that can be used in different ways. In this clip, children used the cubes to represent family members of different heights. The children also used the cubes as a nonstandard measurement tool, to measure the length of their hand.
- The materials also allowed the child to develop an understanding of the rules that apply to measurement. The cubes were all the same size, which modeled the importance of equal-sized unit. Since the cubes connected to each other, the child also learned the importance of not having any gaps between units.

Math Vocabulary and Discourse

- What measurement or comparison vocabulary did the children or educator use?
- In what ways did the educator encourage children to notice and communicate about measurement (for example, by asking questions)?
- In what ways did the educator encourage children to participate in math discussions related to measurement? Some ways children might participate in math discussions include questioning, describing, comparing, or explaining.

Some Possible Responses

- As the child explored the unit cubes, the educator introduced a variety of comparative vocabulary such as long, longest, tall, tallest, shorter, shortest, and small.
- The educator invited the child to use comparative vocabulary by asking her questions such as, "Is Charlie … shorter than you?"

(Possible responses continue on the next page.)

- The educator also frequently elaborated on the child's responses to encourage a math discussion and introduce comparative vocabulary. For example, when the educator asked who in the child's family could be comparable to the smallest tower, the child answered, "My cousin Alexa's baby." The educator elaborated by saying, "Your cousin Alexa's baby could be the smallest one."

Multiple Representations

- What opportunities did the educator offer children to compare, order, or measure in different ways?
- What other learning experiences or materials might the educator offer to continue to build children's understanding of measurement?

Some Possible Responses

- The educator might offer children other nonstandard measurement tools such as craft sticks or bottle caps, or standard measurement tools, such as a measuring tape, that children can use to measure length or height.
- The educator might offer learning experiences that encourage children to compare the heights of different objects or people. For example, children might compare the height of different children in their program, or the height of different plants in their outdoor area.
- The educator might encourage children to use measurement vocabulary while exploring their community. For example, as children move through their community, the educator might ask children to describe the height of buildings, trees, or plants.