

Answer Key for Observing M⁵ in Action

This handout provides sample responses that help facilitators discuss each of the M⁵ 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:

[Decomposing Shapes \(First Grade\)](#)

In this video, children identify and describe why they think one shape doesn't belong. The children and educator discuss concepts related to dividing shapes and directions, such as vertical and horizontal.

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 the children's interests, languages, cultures and lived experiences, abilities, and emerging skills and knowledge.

Some Possible Responses

- The educator learned about children's understanding of geometry by offering an open-ended experience, a question that could be addressed in different ways. Based on the children's answers, the educator learned about the children's level of understanding about geometry concepts related to partitioning. For example, one child focused on equal parts and used the word "equal."
- The child also made connections to equal parts by relating the partitioning of shapes to cutting a cake. The educator acknowledged and affirmed this connection. He repeated what the child said and used this information to explain partitioning a shape into equal parts— "fair shares"—and unequal parts. Pointing to the shape that was not partitioned into equal parts, the educator said, "If this was cake, this would not be fair."

- Another child noticed the direction of the lines that created the partitions and used words like “down” to communicate the direction of the lines. The educator built on this example by providing additional math vocabulary to describe direction as “vertical” and “horizontal.”

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 the open-ended nature 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?

Some Possible Responses

- The experience was open and allowed children to come up with different answers. For example, one child recognized that three of the shapes showed halves and the fourth shape did not.
- Another child paid attention to the direction of the cuts (horizontal versus vertical). The educator encouraged children to explain their thinking and recognized multiple approaches for identifying which shapes didn’t belong. When one child explained that a shape didn’t belong because it was not cut into fair shares, the educator responded by asking the other children, “What do you think?” This response invited children to consider other possible solutions.

Materials and Learning Environment

- What did you notice about the materials and learning environment?
- In what ways did the materials and learning environment promote children's understanding of relevant math concepts?

Some Possible Responses

The materials provided concrete representations of different divided shapes and allowed multiple ways to reason about the question “which shape does not belong?” The materials supported an open-ended learning activity. The children could analyze the images in different ways, including by shape, how the shape was divided (horizontally or vertically), and whether the shape was divided into equal parts.

Math Vocabulary and Discourse

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

Some Possible Responses

- The educator and children used a variety of math vocabulary, such as “fair shares,” “half,” “horizontal,” and “vertical.”
- The educator encouraged children to engage in math discourse by inviting them to explain their thinking.
- The educator repeated and extended each child's answers to clarify their thinking and introduce new math vocabulary. For example, he introduced the term “vertical” to describe the partition of one shape. When a child spontaneously used the term “horizontal” to describe the partition of another shape, the educator praised the child's vocabulary.

Multiple Representations

- What opportunities did the educator offer children to explore and learn about math concepts in different ways?
- What other learning experiences or materials might the educator offer to continue building children's understanding of relevant math concepts?

Some Possible Responses

- The children explored concepts related to fair shares and partitioning. The educator might encourage children to explore and express their understanding of fair shares and partitioning in different ways. For example, the educator might invite children to create other examples of shapes divided into equal parts (show fair shares) by cutting play dough shapes into equal parts.

