Meaningful Investigations

The purpose of this activity is for educators to think more deeply about what makes an experience a meaningful investigation. Educators will read vignettes that describe children of different ages engaged in meaningful investigations. After reading, participants will discuss the different characteristics of the vignettes that contribute to meaningful investigations.

Key Concept

Discuss ways the examples provided are responsive to children's interests, questions, or real-world problems; open-ended and support children to experiment; and provide opportunities for children to use math for a purpose.

Materials and Setup

- copies of Meaningful Investigations Vignettes (see pages 3–5)
- Sample Answers (optional, see page 6)
- paper and pencil for notes

15–30 minutes

small groups

in-person or virtual professional learning

Activity Instructions

This activity works best with a facilitator who can support discussions of the vignettes.

- If you are a facilitator, consider using these instructions as talking points.
- If you are doing the activity on your own, discussing with a partner might be helpful.

Review the vignettes and discuss

- Select a vignette that is meaningful to you (for example, a vignette that shares examples of children in the age-range that you work with).
- Review the vignette.

- Discuss the following with a partner:
  - In what ways is the experience related to children's interests, questions, or real-world problems?
  - In what ways is the experience open-ended, promoting experimentation?
  - In what ways are children able to use math for a purpose?
- After you discuss, you might review the Sample Answers for the vignettes to consider other ways the experiences meet the conditions for a meaningful investigation.

Meaningful Investigations Vignettes

Gabriella Investigates Shapes
(Infants and Toddlers)

- In what ways is the experience related to children's interests, questions, or real-world problems?
- In what ways is the experience open-ended, promoting experimentation?
- In what ways are children able to use math for a purpose?

Gabriella laughs and smiles as she explores differently shaped blocks. She notices they look different and feel different in her hands. Some feel pointy or flat and others feel round and smooth.

She bangs the shapes on the floor and taps them together. She moves her hands over the shapes, stopping to feel the edges. Her educator says in Spanish, "I notice you feeling the triangle. The triangle is pointy."

The educator continues to discuss the shapes and describes their attributes in Spanish, Gabriella's home language.

Filling the Tub
(Preschool/TK/K)

- In what ways is the experience related to children's interests, questions, or real-world problems?
- In what ways is the experience open-ended, promoting experimentation?
- In what ways are children able to use math for a purpose?

The children are curious about how much water a large tub might hold. Together, they fill buckets with water and add the water to the tub.

Their educator asks, "How will you know how many buckets of water you used?" The children consider this question and decide that they need to count.

One child begins counting out loud as each bucket of water is added to the tub. Another child puts up a finger for each bucket of water added. The children realize it is difficult to keep track of how many buckets of water they are using.

Their educator suggests using tally marks. She offers her notepad and pencil. She helps them draw a tally mark each time they add a bucket of water to the tub.

When the tub is full, they count all the tally marks. This helps them figure out how many buckets of water they used to fill the tub.

Garden Designs

(Early Elementary Grades)

- In what ways is the experience related to children's interests, questions, or real-world problems?
- In what ways is the experience open-ended, promoting experimentation?
- In what ways are children able to use math for a purpose?

A second-grade class is learning about perimeter. The class is planning to build a garden with help from family volunteers. They have enough money for 24 feet of fencing boards. The educator encourages children to work in teams to design garden beds that have 24-foot perimeters.

The educator provides the children with planning materials, including 24 inches of string, graph paper, and chart paper. The educator invites children to experiment with different shapes and designs for their garden beds that all have 24-foot perimeters.

Some children use graph paper and count the number of squares that make up the perimeter. Other children use string to lay out their designs. They understand that 24 inches can be used to represent 24 feet.

Children experiment with different designs and shapes. One group makes two smaller garden beds. Another group experiments with a triangular design. Later, the class votes on which design they like best.

Sample Answers

Here are some ways that the examples are related to children's interests, questions, or real-world problems; ways the experiences are open-ended—promoting experimentation; and ways the experiences are purposeful—encouraging children to use math to solve a problem or answer a question.

Gabriella Investigates Shapes
(Infants and Toddlers)

- Gabriella notices how blocks of different shapes look and feel because she has interest in the objects.
- The materials are open-ended, allowing Gabriella to experiment with different ways to use the blocks.
- She is developing spatial thinking and shape knowledge through her desire to explore and manipulate shapes.

Filling the Tub
(Preschool/TK/K)

- Children investigate an authentic, real-world question, based on their interest.
- Children experiment with different approaches to solving a problem.
- Children use math for a purpose. They count and track data to find out how many buckets of water they use to fill the tub.

Garden Designs
(Early Elementary Grades)

- Children investigate an authentic, real-world question.
- Children experiment with different methods to design their garden beds and find the perimeter of shapes.
- Children use knowledge of geometry, measurement, and addition for a purpose—designing their garden beds.