

Mathematics:

Understanding How Children Demonstrate the Mathematics Foundations in Early Care and Education Settings

Strands:	<i>Number Sense</i>	<i>Algebra and Functions</i>	<i>Measurement</i>	<i>Geometry</i>	<i>Mathematical Reasoning</i>
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GETTING READY

Instructional Component(s): In-Class Activity; Out-of-Class Activity

Strands: This activity can be used to develop familiarity with and deepen understanding of all mathematics strands or of individual strands.

Focus: Students engage with activities that are typical of those that young children experience in early childhood settings. By interacting with materials and engaging in routines, they directly experience the everyday mathematics in early care and education settings.

AFTER PARTICIPATING IN THIS ACTIVITY

- The foundations in mathematics, including strands, substrands, foundations, and examples of foundations (introductory understanding) (*Standards 1, 5, & 6*)*
- Where and how children experience mathematics in their early childhood education programs (*Standards 4 & 5*)*
- The developmental progression of knowledge and skills in mathematics (*applies to "Taking it out of class"*) (*Standards 1 & 5*)*

Students will be able to:

- Connect specific foundations and related strands to typical activities in an early childhood education setting (*Standards 1, 4, & 5*)*
- Identify where and how children engage in and demonstrate skills and behaviors described in the foundations in mathematics during a typical day in an early childhood setting (*Standards 1, 4, & 5*)*
- Recognize children experiencing mathematics in an early childhood setting (*applies to "Taking it out of class"*) (*Standards 1 & 3*)*
- Identify knowledge and skills in mathematics that are characteristic of younger and older preschool children (*applies to "Taking it out of class"*) (*Standards 1 & 5*)*

*See Appendix A

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Before you start

To help students see where children are regularly engaging with the content of the math foundations in early care and education programs, provide the opportunity to experience typical activities from an early childhood setting.

Set up the room with materials for typical activities and routines from an early childhood group setting. For example, place materials such as these on different tables: play dough, manipulatives, art materials, dress-up items, blocks, books, snack materials, and water play objects. If you have space, also set up an obstacle course.

You will need to have envelopes containing all the substrands. If you have done the activity titled “Piecing Together the Mathematics Domain Puzzle,” you will have these already prepared. You can also use the worksheet at the end of this activity. You can use foundations themselves, but because of the number it might be better to work at the substrand level.

Getting it started

Place an envelope containing strips of all the math substrands at each table. These strands can be found in a worksheet at the end of this activity. Remind students not to open the envelopes immediately. Have students spend 10-15 minutes working with the materials at that table. After they have spent 10-15 minutes working with the materials, ask them to take out the strips and find the math foundations that children would experience while engaging with those materials.

Keeping it going

Depending on the time available and the goal for this activity, you might consider having students rotate through the stations to help them identify a variety of foundations. This might also allow for discussion between groups who visited the same table but who may have identified different foundations at that table.

If groups are rotating from table to table, ask them to list the foundations identified at each station on a sheet of paper and place all the strips back into the envelope so that the next group can use them.

Putting it together

Once students have completed this activity, reconvene the group and ask them to list the foundations for each table so that all can review them. You might do this by distributing chart paper to each table and asking students to tape their list of foundations to each chart paper or write down what is on their lists. Provide an opportunity for students to rotate again and see what foundations each group associated with each table.

Targeting individual strands



Slides 2-4

Help students to connect the specific foundations and related strands to their experiences at the tables by asking the following question.

At which table or with which materials would children be gaining experience with each strand:

- Number Sense
- Algebra and Functions
- Measurement
- Geometry
- Mathematical Reasoning

Follow this with a conversation about the experience.

- What stands out to you as you look at the lists that have been generated?
- What does this tell us about how and where children experience math in the early childhood classroom?
- If you rotated to a second table, were you more aware of what math might be experienced there? Why?

Taking it further

As an important extension, ask students to consider times and activities during the day not represented by the activities they just did when children might engage with each of the math strands.

Some topics are particularly rich, such as the following activities:

- Cleanup
- Outdoor play
- Meals or snack
- Water or sand table*
- Obstacle course*

They could do this with an assigned time or activity, or they could brainstorm generally and their ideas could be recorded and organized as they are generated in the group.

Again it might be helpful to have cut-out strips, lists or tables with the foundations available so that it is easier for students to correlate activities with substrands found in the foundations.

* Math opportunities at the water or sand table and obstacle course would be best experienced if they could be set up for exploration, but if not, they are still important to explore in the brainstorming activity.

**Taking it
out of class**

This activity could also be done as an out-of-class observation activity. Ask students to observe some of the activity centers in a preschool program for 15-20 minutes. Anecdotal recording of what children do and say would be a rich way to document this observation. Students could then use their notes as evidence of children demonstrating the development as referenced in the foundations.

If they can do this with both preschool children of differing ages, it will help them see the developmental progression that children go through during preschool years as described in the mathematics foundations.

Substrands from the Mathematics Domain

Children begin to understand numbers and quantities in their everyday environment.	Children expand their understanding of numbers and quantities in their everyday environment.
Children begin to understand number relationships and operations in their everyday environment.	Children expand their understanding of number relationships and operations in their everyday environment.
Children begin to sort and classify objects in their everyday environment.	Children expand their understanding of sorting and classifying objects in their everyday environment.
Children begin to recognize simple, repeating patterns.	Children expand their understanding of simple, repeating patterns.
Children begin to compare and order objects.	Children expand their understanding of comparing, ordering, and measuring objects.
Children begin to identify and use common shapes in their everyday environment.	Children identify and use a variety of shapes in their everyday environment.
Children begin to understand positions in space.	Children expand their understanding of positions in space.
Children use mathematical thinking to solve problems that arise in their everyday environment.	Children expand the use of mathematical thinking to solve problems that arise in their everyday environment.