

# Unit 6 – Mathematics

## Getting Ready for the Unit and Connecting to Experience

### Focus Statement

Students reflect on their own early mathematics experiences by answering a series of questions.

### Getting Ready for the Unit

The mathematics domain in the *California Preschool Curriculum Framework, Volume 1* (PCF, V1) builds on the mathematics domain in the *California Preschool Learning Foundations, Volume 1* (PLF, V1) and is organized by the same strands and substrands. It should be noted that the wording of the substrands in the PCF, V1 is different from that in the PLF, V1. The ten mathematics guiding principles and the environments and materials for the mathematics domain in the PCF, V1 are at the domain level while the vignettes, teachable moments, and interactions and strategies are at the substrand level.

When discussing the relationship between the mathematics domains in the PLF, V1 and the PCF, V1, it is important to guide students in understanding that the foundations are goal-like statements of what we would like to see in young children's mathematical development and learning while the curriculum framework provides tools for how to support children's mathematical development and learning. This distinction is addressed in the first key topic of this unit, but it would be helpful to remind students about it as they work in other key topics.

As stated in the introduction to the chapter on mathematics of the PCF, V1, "Young children seem to have an innate sense of informal mathematics. They develop a substantive body of informal knowledge of mathematics from infancy throughout the preschool years" (PCF, V1, p. 232). Also, "[Preschool teachers] help children build their knowledge and skills of mathematics over time, by providing a mathematically rich environment, by modeling mathematical thinking and reasoning, and by introducing children to the language of mathematics (PCF, V1, p. 233). This unit is designed to support students in fulfilling those roles by familiarizing them with the contents of Chapter 6 of the PCF, V1.

Because the mathematical knowledge and skills related to number, quantity, size, shape, and space and the process of mathematical reasoning may be unfamiliar to

some students, it is very important that instructors be very familiar with the mathematics foundations. Then they will be able to provide opportunities for students to develop a basic understanding of these mathematics concepts and skills through lectures or other active learning methods. Descriptions of the mathematics strands can be found in both the PLF, V1 (pp. 145-147) and the PCF, V1 (pp. 241, 259, 272, 281, and 290). Examples of the research base are also in the PLF, V1, (pp. 160-166) and PCF, V1 (pp. 251, 264, and 273). A set of PowerPoint slides in the introduction to the Instructional Guide for the *California Preschool Learning Foundations, Volume 1* (PLF, V1)—Mathematics Domain—also provides an overview of the mathematics foundations.

You may want to review “Piecing Together the Mathematics Domain Puzzle” (Activity 4 of the Instructional Guide for the PLF, V1, Mathematics Domain) and “Understanding the Research and Evidence Base for the Mathematics Domain” (Activity 5 of the Instructional Guide for the PLF, V1, Mathematics Domain) as methods for students to familiarize themselves with the mathematics strands, substrands, and foundations.

Some of the key topics in this unit suggest having students do observations in early care and education settings. Therefore, it may be helpful to have a list of programs that students can visit. It will also be helpful to have photographs or video clips of classrooms to use during class sessions, especially if it may be difficult for students to visit programs.

Because mathematics vocabulary is a major part of children’s construction of mathematical concepts, students also need to be very aware of ways to support children who are English learners in understanding this vocabulary. Information in Unit 5 on English-language development in this PCF, V1 instructional guide can help students identify strategies to use with these children.

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## Motivator and Connection to Experience

### Before You Start

Research indicates that understanding mathematics, beyond the intuitive and informal experiences that many children have, is critical to future academic success. However, many students and practitioners may not fully engage young children with mathematics experiences because they are uncertain about their own knowledge and skills relating to mathematics. Consequently, many students find it hard to engage with the concepts and possibilities of helping young children’s development relating to mathematical concepts.

This motivator exercise is adapted from Activity 1 from the Instructional Guide for the *California Preschool Learning Foundations, Volume 1—Mathematics Domain—*

“Exploring Our Early Connections to the Mathematics Foundations.”

Students are asked to reflect on their own early mathematics experiences by answering a series of questions. As with any activity in which students are asked to reflect on past experiences, some strong emotional responses may be elicited, and there may be students whose memories will not be positive ones. It is important to acknowledge this and allow students to participate in the discussion as much or as little as they choose. It is also recommended that a short break be planned after this activity so that there is an opportunity for students to deal with any strong emotions that may have surfaced.

## Active Learning



Slide 2

### Getting it started

Explain that you are going to ask the students to think about their early experiences learning mathematics by answering the following questions:

- When you reflect on your own experiences learning mathematics, what specific memories come to mind? You may remember particular classes, instructors, activities, or homework assignments.
- Think about a time when you enjoyed mathematics. Why do you think you enjoyed mathematics? What do you remember that made mathematics enjoyable? Again, consider particular classes, instructors, activities, or homework that may have been particularly interesting, fun, or rewarding.
- Was there a time when you thought mathematics was hard or you couldn't understand it? Why do you think this happened? Were there particular classes, instructors, activities, or homework that may have posed a challenge for you?

### Keeping it going

Have students find one or two partners and take turns sharing their responses. Remind students that they can share as much or as little as they are comfortable doing. Then ask for volunteers to share some of their memories and stories with the whole class.

### Putting it together

Conclude with a class discussion about the experiences that



Slides 3-4

were shared. The following questions may help guide the discussion:

- What are some things that stand out for you from people's remembrances and stories?
- Which ones resonated with you? Which ones surprised you?
- What are some themes that emerged from these experiences?
- Why is it helpful to think about the ways you learned mathematics and how you feel about math?
- What do you want to remember from this exercise when you are planning curriculum to support young children's mathematical development?