CDE/ECE Faculty Initiative Project
California Preschool Learning Foundations, Volume 1

Introduction to the Instructional Guide for the Mathematics Domain

This instructional guide is organized to support faculty in addressing the content and research base of the mathematics foundations. Accordingly, the instructional guide for these foundations is designed to support faculty as they deepen students' understanding of the structure, content, and research base of the foundations.

The guide is *not* intended to support faculty in helping students learn to *assess* children's learning and development related to the mathematics foundations. It is also *not* intended to support faculty in helping students learn how to design *curriculum* related to children's development of mathematics knowledge and skills. There are some activities that touch on these issues, but future instructional guides will address forthcoming California Department of Education preschool assessment and curriculum framework publications for these purposes.

The mathematics domain of the *California Preschool Learning Foundations, Volume 1* (PLF, V1*)* consists of five strands: (1) *Number Sense*; (2) *Algebra and Functions (Classification and Patterning)*; (3) *Measurement*; (4) *Geometry*; and (5) *Mathematical Reasoning*. The activities in this instructional guide allow faculty to address all the strands in an integrated approach or to focus on individual strands.

Consistent with the overall organization of the preschool instructional guides, the materials in this guide adhere to a framework of five core instructional components:

- Motivator and/or Connection to Experience
- Information Delivery
- In-Class Activity
- Out-of-Class Activity
- Assessment

These components are described fully in the overall introduction to this instructional guide.

Many activities include a suggestion for assessment of students' skills and/ or knowledge gained through the activity. Topics for additional study or research by students are included as *Deepening Understanding* activities at the end of the domain.

Most activities in the mathematics domain of the *Instructional Guide for the Preschool Learning Foundations, Volume 1* are to be done in class with suggestions included for out-of-class extensions. The intention is to thoroughly ground students in the structure,

content, and research base for these very important foundations and to build student confidence in their understanding of this domain.

It is suggested that faculty first use activities that directly explore the structure and content of the mathematics foundations before moving on to activities that use the foundations for further exploration of development in mathematics.

Organization Of Each Activity: Flexible Segments

Each activity is comprised of segments that allow faculty to make choices about implementation. The segments are italicized below as they are described.

Each activity begins with a section titled *Getting Ready*. This section can be found on the first page of every activity and provides an overview to help faculty decide if the activity fits into their purpose and goals for a class session. In this section there is a reference to the strands and a short description of the focus of the activity. A few tips for faculty preparation or reflection, labeled *Before you start*, are included before the activity. The activities themselves are divided into *Getting started, Keeping it going, Putting it together, Taking it further, Another way, Taking it out of class,* and *Assessment.* Not every activity includes all of these segments. Also note that assessments are included as segments within activities rather than as separate activities.

Throughout the Instructional Guide, you will sometimes see this symbol in the left margin below activity segments. This symbol indicates that there are PowerPoint slides that correspond to a particular part of the activity.

Slide 3

Knowledge and Skills

Each activity is accompanied by a description of the knowledge and skills students can gain from participating in that activity. The knowledge and skills can be found on the first page of each activity immediately following the *Getting Ready* section. The knowledge and skills associated with each activity might be useful in developing student learning outcomes, course objectives, or program objectives. Of course, the extent to which any student will attain the knowledge and skills will depend on both the breadth and depth with which faculty implement the activity.

These knowledge and skills have been aligned with early childhood professional standards from the National Association for the Education of Young Children (NAEYC) (see Appendix B) and the National Board of Professional Teaching Standards (NBPTS) (see Appendix C). The alignment with the core NAEYC professional standards uses the most recently revised edition (January 2009). In this revision, Standard 4 was divided into two separate standards, including one focused on teaching methods and the other on early childhood content (see Appendix B). Following each knowledge concept or skill, the notation in parentheses refers to the specific standard(s) from the *NAEYC Standards for Professional Preparation* with which it has been aligned. In addition, a matrix of the overlap between the NAEYC Professional Teaching Standards and the NBPTS has been included as a reference (see Appendix A). Please refer to Appendix A for the corresponding standards cited in the knowledge and skills for each activity.

Additional Thoughts

The activities in this guide are written to be adapted and, therefore, are not intended to be used as scripts. Each activity provides a framework within which faculty will need to plan and reflect on what will work best with their particular students. Several of the activities are straightforward examinations of the content of the strands, substrands, or foundations themselves. Others activities support deepening students' understanding of early mathematics as it is expressed in the foundations. This has the potential to bring some students to a deeper understanding of their own mathematics development, with sometimes challenging consequences. The extent to which any faculty develops these conversations will depend on the level of comfort and experience with these issues.

Much of early mathematics learning involves learning the language of mathematics, which means that language development strongly influences development of early mathematics concepts. Consequently, faculty might also benefit from being familiar with the foundations for English-language development and language and literacy, since they are closely related to the foundations for mathematics.

CDE has published a resource guide titled *Preschool English Learners: Principles ad Practices to Promote Language, Literacy, and Learning.* This guide provides foundational information regarding language and literacy development in all children, with special attention to English-language development in children for whom English is not their home language. Many faculty have found this publication to be helpful in supporting students who are learning about mathematics and the language of mathematics. The Faculty Initiative Project has produced an instructional guide for this publication, the *Instructional Guide for the Preschool English Learners: A Resource Guide*, which is available online at www.wested.org/facultyinitiative/pelguide.html.