Unit 6 – Mathematics
Key Topic 4: Universal Design, Individualizing, and Family Partnerships

Focus Statement

Students explore methods for approaching universal design, individualized curriculum decisions, and family partnerships in the context of supporting children's development and learning in mathematics.

Before You Start

As stated in the introductory chapter to the framework, "a fundamental consideration in planning curriculum for individual children is being responsive to the competencies, experiences, interests, and needs each child brings to the preschool classroom" (*California Preschool Curriculum Framework, Volume 1*, p. 3). This requires being responsive to diverse cultural communities, languages, family structures, abilities, and socioeconomic backgrounds.

In addition to the diversity just described, children enter preschool with a wide range of experiences related to early language and literacy development (PCF, V1, p. 98). Children's parents may also have a wide range of language and literacy skills in their home language and/or English. Because mathematics vocabulary is an essential component of children's mathematical development, it is very important for students to learn ways to support young English learners in acquiring mathematics knowledge and skills. Students can find strategies and resources in the English-language development domain in both the *California Preschool Learning Foundations, Volume 1* (PLF, V1) and the *California Preschool Curriculum Framework, Volume 1* (PCF, V1) and the *Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning, 2nd edition.*

To support these contributions in curriculum planning, this key topic is divided into three subtopics. Each emphasizes features of the curriculum framework that focus on working with each child as an individual: universal design, individualizing curriculum, and forming partnerships with families.

In the first subtopic, universal design, it is suggested that a guest speaker or a panel present to your class on considerations when planning for children with disabilities or special needs. Suggestions for presenters include early childhood special education teachers, speech and language therapists, occupational therapists, assistive

technology specialists, preschool teachers with experience in including children with disabilities in their classes, and parents of children with disabilities or special needs.

Please note that the same active learning segments for the Universal Design, Individualizing, and Family Partnerships subtopics are used in the social-emotional development, language and literacy, and English-language development domains. Slight modifications are made in each domain to reflect its specific content. This should enable instructors to use each key topic individually in each domain or to collapse the subtopics across domains.

Information Delivery

The following content from the *California Preschool Curriculum Framework, Volume 1* (PCF, V1) is referenced in this key topic and may be delivered through lectures and/or assigned readings:

- California's Preschool Children (pp. 3-5)
- Universal design for learning (p. 13)
- Domain guiding principles for mathematics: "Provide an environment rich in language, and introduce preschool children to the language of mathematics" and "Support English learners in developing mathematical knowledge as they concurrently acquire English" (p. 235)
- Overarching principle: "Individualization of learning includes all children" (pp. 7-8)
- "Partnering with families in curriculum planning" (p. 23)

Point out that Appendix D in the PCF, V1, Resources for Teachers of Children with Disabilities or Other Special Needs, is a resource for the subtopic of universal design (pp. 319-322).

The *Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning, 2nd edition* (PEL Resource Guide), and its accompanying instructional guide are also good resources for the second subtopic on individualizing.

Active Learning

Subtopic 1: Universal Design

Slide 2

Getting it started
Begin by having students read the definition of and key points about universal design for learning described in the framework (PCF, V1, p. 13). Write each approach (i.e., "multiple means of representation," "multiple means of expression," and "multiple means of engagement") at the top of a sheet of chart paper. Because these concepts may be new to your students, it is suggested that you spend some time discussing each one by reviewing the examples provided in the PCF, V1 and providing some additional ones. Also encourage students to share any experiences they have had with adapting curriculum for young children with disabilities or special needs. Ask a few students to write these examples from the PCF, V1 under each heading.

Keeping it going
This segment could be done as an out-of-class assignment.

Point out to students that suggestions for supporting children with disabilities and special needs can be found in the environments and materials and interactions and strategies of the PCF, V1.

Have students work in pairs or small groups, and assign each group a different strand or substrand. Ask them to review the environments and materials and interactions and strategies. In Key Topic 3 of this unit, there is a list of the number of interactions and strategies for this domain that could help you assign roughly equal numbers to the pairs or groups. Ask the students to find examples that would be useful in working with children with disabilities or special needs. Point out to students that most of these are useful for all children when applied with reflection and intention.

It is important to explain to students that partnering with early childhood special education staff is an essential part of determining appropriate adaptations for a child with a disability or special need.

Taking it further
Have students work individually or in small groups to review their lists of interactions and strategies that could support

children with disabilities or special needs. Have students write each suggestion on a half sheet of paper or large Post-it® note. Their task is to decide if the suggestion falls under "multiple means of representation," "multiple means of expression," or "multiple means of engagement." Remind students that some suggestions may fall under more than one heading.

Then ask students to place the note on the chart paper with the appropriate heading. You could also have students do this by labeling three sheets of paper or three columns on a sheet of paper with the three approaches and writing the suggestions under their chosen heading.

After students have finished posting their suggestions on the appropriate categories, discuss why they made their matches.

Putting it together

You may wish to conclude this subtopic by having students discuss the following questions:

Slide 3

- What are some of the key concepts in universal design?
- Which concepts were clear to you? Which concepts were confusing?
- What other questions do you have about universal design related to mathematics?
- What resources do you think would be most helpful to you in your work?

Another approach

This method could be done instead of the preceding exercises or in addition to them as an expansion.

Explain to students that they will be hearing from a guest speaker or panel to discuss considerations when planning for children with disabilities or special needs. This is not intended as an in-depth exploration but as an introduction to some of the ways in which curriculum can be made responsive to the needs of all children.

Ask the presenters to address the importance and ways of supporting children's mathematical development—including having access to experiences, materials, and activities that promote mathematical learning; interacting with their peers and

adults in the class; and partnering with families and specialists. Provide the presenters with the information on universal design in the PCF, V1 on page 13 and ask them to include examples of how they've used some of the strategies suggested. If students are not familiar with special education, ask the presenters to also give a brief overview that includes a summary of the assessment and IEP process; how services are provided; and ways that the special education teachers, therapists, and other specialists can work with teachers in preschool programs to figure out and/or provide the adaptations for each child who has a disability.

Ask the students to note examples of each of three universal design approaches from page 13 of the PCF, V1 that the speaker or panelists describe that support mathematical development.

After the speakers have left, ask students to write any additional suggestions from the presenters on the chart papers or their own lists. Have students respond to the following questions individually or through a class discussion:


Slides 4-5

- What information from the presenter(s) caught your attention or stood out for you?
- What are you most confident about in supporting the mathematical development of children with disabilities? What concerns you?
- What new or different perspectives do you have? How has this presentation been helpful?
- What do you want to keep in mind when you are planning ways to modify or adapt the learning environment and experiences for children with disabilities to ensure their progress in constructing mathematical knowledge?

Subtopic 2: Individualizing


Slide 6

Getting it started

Begin this subtopic by reviewing the section in the framework titled "California's Preschool Children" (PCF, V1, pp. 3-5). Have students find and summarize the key points and share them through a classroom discussion.

Keeping it going
Next have students read the sixth overarching principle, "Individualization of learning includes all children" (PCF, V1, pp. 7-8).

Ask students to give examples of differences you might see in different children for each of the characteristics described in the sixth overarching principle: " . . . temperament, family and cultural experiences, language experiences, personal strengths, interests, abilities, and dispositions . . ." Ask some students to chart or take notes of the examples.

Then continue the class discussion by reviewing the examples and asking the students to describe possible implications of these individual differences in supporting children's mathematical development

Taking it further
Assign a substrand to individual or groups of students and have them review the interactions and strategies for the assigned substrand. The students can reference the lists developed in Key Topic 3 of this unit, or you may provide them with a list. As they review the interactions and strategies, they are to note ways that the strategy can help teachers get to know children individually. For example, the strategies "Observe and listen to children's counts" in the "Understanding Number and Quantity" substrand (PCF, V1, p. 244) and "Engage preschool children in conversations about their sorting and classifying" in the "Classification" substrand (PCF, V1, p. 262) can help teachers learn about individual children's understanding and use of language as well as their understanding of and skills related to counting and classifying.

After the students have had time to identify examples in their assigned strategies and interactions, ask for some students to share one or two of their ideas with the whole class. Continue the discussion until students have a good sense of how the interactions and strategies can support individualization for children.

Putting it together
Conclude this subtopic by having students consider the following questions that could help them get to know the individual characteristics of children who might be in their

classrooms and how to plan for each child's continuing progress in mathematical development:


Slides 7-8

- What kinds of documentation could you use to help understand individual children in terms of their mathematical development?
- What are some ways you could get to know the families of individual children and how they support their children's mathematical learning?
- How could you learn about the child's community?
- How could you find out what things a child is interested in that could be used to engage her in mathematical learning experiences?
- What kinds of information about the child could you obtain by observing him during the different parts of the daily routine?
- What are some ways you could determine each child's strengths related to his/her mathematical development?

Subtopic 3: Family Partnerships

Getting it started

Point out to students that there is a section entitled "Engaging Families" at the end of each strand (PCF, V1, pp. 257-258, 269-270, 279-280, 288-289, and 294). Ideas to give to families for use at home are listed in each of these sections. Assign groups of students to each strand and have them list a brief summary of each strategy in their strand on pieces of chart paper—two strategies per sheet with blank space between the two strategies or as headings for two columns. They are then to list examples from the framework under each strategy and post their chart sheets on the wall.

Keeping it going

Next have the groups move to another sheet of strategies and add other ideas for implementing the strategy. This is similar to a brainstorming activity, so allow about 5 minutes per rotation and continue until all groups have added ideas to all the strategies.

Taking it further
Continue this exercise by having students review pages 3-5 of the PCF, V1, "California's Preschool Children," and identify examples of how children's families are diverse.

Ask students to next think about other ways families are unique:

- Family composition in the home including primary caregivers, siblings, other family members
- Length of time in the United States
- Parents' educational experiences in the U.S. or other countries
- Parents' literacy skills
- Types of employment and work schedules
- Parenting beliefs and practices

Discuss how each of these characteristics might impact children's mathematical development.

Next have the students identify any considerations or additional ways to individualize the strategies for families. You could do this as a large group discussion or have the original groups add the considerations and additional strategies for their strand. Each group could then present its ideas.

Another approach
Instead of having students brainstorm ways to implement the strategies for engaging families (described in "Keeping it going"), have students interview teachers and parents to identify examples. These interviews could be conducted in different ways:

- Students first ask teachers and parents for ways that they have partnered. Then have students list these examples under the different strategies.
- Assign students different strategies and have them ask teachers and parents for examples for those specific strategies.

Putting it together
Conclude this subtopic by having students respond to these

questions:

Slides 9-10

- What considerations or ideas about the impact and influence of families on children's mathematical development caught your attention?
- Which ones resonated with you because of your experiences with children and families?
- Which strategies or interactions do you think are most important to include in order to build strong partnerships with families that foster children's mathematical development?
- What is a first step you would take in building these partnerships?

Reflection

You could have students reflect on this key topic by having them respond to the following questions for each subtopic or for the overall key topic. This could be done through journaling or as a discussion.

Slide 11

- What ideas stood out most for you today?
- Which ones reinforced what you have already learned or experienced? Which ones gave you a new perspective or insight?
- How might you apply a new perspective to your work now or in the future?
- What further information or support do you need?
- What first step do you need to do?

Deeper Understanding

The resources and references on pages 297-299 of the PCF, V1 contain articles related to the three subtopics: mathematics and children who are English learners; mathematics and children with disabilities or special needs; and mathematics and involving parents. Ask students to choose one of the three subtopics and identify the relevant resources and references. They are to write a discussion of the findings from these articles. This assignment could be extended to deeper research if appropriate for your students and particular class.