Unit 3 – Science:
Key Topic 2: Getting to Know Environments and Materials that Support Science

Focus Statement

Students review the strategies for planning and setting up the physical and social environments to promote children's learning in science. Students also compare these strategies with the lists of suggested materials.

Curriculum Alignment Project (CAP) Student Learning Outcomes

The Curriculum Alignment Project's (CAP) lower division eight courses and student learning outcomes are mapped onto each instructional guide learning experience. See Appendix A for the specific student learning outcomes, objectives, and examples of course content and topics for the courses listed below.

- Child, Family, and Community
- Introduction to Curriculum
- Principles and Practices for Teaching Young Children
- Observation and Assessment
- Practicum-Field Experience

Instructional Methodologies

- Class discussion
- Notetaking outline or guide
- Pairs or small groups
- Reflective discussion

California Early Childhood Educator Competency Areas to Consider

The Faculty Initiative Project will undertake a comprehensive process in the future to map the content of the instructional guides to the California Department of Education, Early Education and Support Division's *California Early Childhood Educator Competencies*. The "Competency Areas to Consider" below are listed in this instructional guide as a preliminary exploration of how particular competency areas might be addressed through these learning experiences.

- Family and Community Engagement
- Observation, Screenings, Assessment, and Documentation
- Learning Environments and Curriculum
- Professionalism
- Administration and Supervision

Unit 3 – Science:
Key Topic 2: Getting to Know Environments and Materials that Support Science

Before You Start

The science domain, like all domains in California's preschool curriculum framework, provides strategies for "Environments and Materials" that support young children's learning in the specific domain. In the *California Preschool Curriculum Framework, Volume 3*, the suggestions for environments and materials for the science domain are on pages 142–150. These are divided into two main categories: "The Physical Environment" on pages 142–147 and "The Social Environment" on pages 147–150. Including the social environment supports establishing a "culture of inquiry," which is fundamental to nurturing the processes of exploration, investigation, and critical thinking in young children. In a preschool environment with a culture of inquiry, the teacher asks open-ended questions to encourage children to think and talk with each other. This key topic will ask students to explore both aspects—the physical environment and the social environment—of supporting science learning in early childhood settings.

In addition, this key topic calls attention to the Appendix called **"**Suggested Materials**"** on pages 234**–**236 of the *California Preschool Curriculum Framework, Volume 3*. Students are asked to consider these materials as they might apply to the suggested strategies for both physical and social environments. Two handouts accompany this key topic. Handout 1 relates to the physical environment, and Handout 2 relates to the social environment. The handouts provide grids with the suggested strategies in the rows and major categories of suggested materials in the columns. They can be used in several ways, but the discussion in the **"**Keeping it going**"** segment is critical to student learning with these handouts. With faculty guidance through the suggested questions, students will see that science learning is pervasive in the early childhood setting, yet requires intentional planning **and** attention to teachable moments. Electronic versions of these handouts will be available when this instructional guide is online at http://facultyinitiative.wested.org/.

If students have not had experience with this domain, faculty might want to spend some time with students reviewing the organization of the domain as presented in Unit 3, Key Topic 1, Subtopic 2 of this instructional guide or all of Key Topic 1, which explores the rationale and guiding principles for the domain as well as the organization of the domain.

Information Delivery

Slide 2

Ask students to read pages 142–150 of the science domain in the *California Preschool Curriculum Framework, Volume 3*. They could do this before coming to class, or time could be given in class. Also, ask students to locate and review the publication Appendix on pages 234-236 called "Suggested Materials."

Active Learning

Getting it started

Organize students into groups of two, three, or four. The size of the groupings does not matter as much here as the opportunity to explore and discuss the material with peers. Let students know that they will be using the handouts that accompany this key topic. Faculty can give each group both handouts, divide the handouts between the groups, or work with one handout and then the other.

Slides 3-4

Ask students to find the strategies to set up a physical environment (Handout 1) or social environment (Handout 2) and the four major categories of suggested materials. For each strategy, students are asked to locate the category of suggested materials that would support that strategy and mark the corresponding rectangle on the grid with an x. Ask students to also provide a few examples for that decision.

For example, for the strategy "Provide a variety of natural materials to observe and investigate," which category of the suggested materials would support this? If students identify three or four categories of materials that would apply to this strategy or all of the categories, ask them to mark all that they think would apply. Then ask them to highlight the one that would be most important, or faculty could ask students to rank their choices.

Online Options

Students could complete the assigned handouts out of class and then post their completed handouts for their classmates and instructor to review. Students could then compare their own responses with those of some other students as preparation for an in-class discussion.

Slide 5

Keeping it going

When students have had he opportunity to work with the handouts, develop a discussion with the following questions:

- What stood out for you as you worked with these handouts?

Faculty Initiative Project *Instructional Guide for the California Preschool Curriculum Framework, Volume 3*
Science Domain
CDE/Early Education and Support Division (formerly CDD) and WestEd Center for Child and Family Studies

- What happened when you worked with the strategies and materials? What discoveries did you make?
- What were the differences between working with physical environments and social environments?
- What does this suggest to you about science learning in the preschool environment?

Taking it further

Slide 6

The preceding discussion might provide opportunities to explore what is meant by planning physical and social environments, intentional teaching, teachable moments, and the interplay between them. In a preschool social environment with a culture of inquiry, the teacher asks open-ended questions to encourage children to think and talk with each other. If the discussion does not surface these concepts and students are not familiar with these terms, faculty could follow up on the discussion in the "Keeping it going" segment to introduce these concepts. In either case, there is a description of intentional teaching as one of the overarching guiding principles for all the frameworks, on page 7 of the *California Preschool Curriculum Framework*, *Volume 3* that could be used to support this discussion. "Teachable Moments" and "Planning Learning Opportunities" are addressed briefly on page 11. Students will develop a better understanding of these last two terms as they encounter them within the domains.

Reflection

Conclude this key topic by asking students to reflect on their experience of this key topic by responding to the following questions:

Slide 7

- What did you learn about the materials that are recommended in the publication "Appendix: Suggested Materials?"
- Where were there struggles in this learning experience?
- How does this make you feel about planning science curriculum for young children?
- What will you do with this information?

Faculty Initiative Project *Instructional Guide for the California Preschool Curriculum Framework, Volume 3*
Science Domain
CDE/Early Education and Support Division (formerly CDD) and WestEd Center for Child and Family Studies

Environments and Materials: The Physical Environment
Relating Suggested Strategies to Suggested Materials

Suggested Materials ➡ **Strategies for Planning the Physical Environment** ⬇	Scientific tools	Open-ended objects and materials	Living things	Books
Be thoughtful about what objects and materials to include in environment.				
Provide a variety of natural materials to observe and investigate.				
Include objects and materials that allow for creativity and open-ended investigation.				
Include living things in the preschool environment.				
Include scientific tools for observation, measurement, and documentation.				
Make scientific tools available throughout the preschool environment.				
Consider adaptations in scientific tools and materials for children with special needs.				
Use technology to support children's scientific experiences.				
Present documentation of science-related experiences in the preschool environment.				
Include children's books with science-related content.				

Environments and Materials: The Physical Environment Relating Suggested Strategies to Suggested Materials				
Suggested Materials → **Strategies for Planning the Physical Environment ↓**	Scientific tools	Open-ended objects and materials	Living things	Books
Use the outdoors for natural explorations and investigations.				
Organize the space in ways that promote children's explorations. • Space. • Flexibility. • Accessibility. • Social interactions.				
Always be aware of children's safety.				

Environments and Materials: The Social Environment Relating Suggested Strategies to Suggested Materials				
Suggested Materials ➡ **Strategies for Planning the Social Environment** ⬇	Scientific tools	Open-ended objects and materials	Living things	Books
Foster children's curiosity and questioning.				
Guide children in exploring their questions.				
Be an active observer.				
Talk with children and engage them in conversations.				
Model the use of scientific vocabulary.				
Know when to intervene and when to stand back.				
Provide children with time.				