



Science: Exploring the Content and Vocabulary of the Science Domain

Focus Statement

Students become familiar with the concepts and key vocabulary of the science foundations by reviewing new or unfamiliar vocabulary and demonstrating examples of the foundations.

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.

- Introduction to Curriculum
- Principle and Practices of Teaching Young Children
- Teaching in a Diverse Society
- Practicum-Field Experience

Instructional Methodologies

- Class discussion
- Class presentation
- Development of a resource tool
- Jigsaw reading
- Notetaking outline or guide
- Pairs or small groups
- Personal Reflection
- Reflective discussion
- Role playing
- Short paper or report



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.

- Culture, Diversity, and Equity
- Dual-Language Development
- Special Needs and Inclusion
- Learning Environments and Curriculum
- Professionalism



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Before You Start

From the day they are born, children are engaging in science—“ . . . finding out how the world works (*California Preschool Learning Foundations, Volume 3*, p. 48).” Their natural curiosity leads them to explore and experiment, using their senses and developing physical, social, language, and cognitive skills. Because research has shown that very young children are ready and able to learn many scientific concepts and practice some of the basic skills of scientific inquiry, there has been increasing interest in and recognition of the importance of science in the preschool curriculum. This emphasis not only helps prepare children for studying science in school but also nurtures the joy that children experience in discovery and learning.

In this learning experience, students will become more familiar with the content of the science foundations by examining the vocabulary presented in this domain and demonstrating examples of the foundations. Language is an essential component in developing scientific inquiry skills, and children develop the language skills and learn the specific vocabulary that helps them “ . . . describe their observations, plan explorations, and communicate findings, explanations, and ideas to others (*California Preschool Learning Foundations, Volume 3*, p. 53).” Similarly, students need to be familiar with this vocabulary so that they can understand and recognize how a child is demonstrating a knowledge or skill described in a foundation.

Students will also explore the content of the foundations by role-playing behaviors that they might see in preschoolers who are demonstrating the competencies addressed in a specific foundation. The purpose of role playing is to heighten students’ awareness of the many different ways children may demonstrate those competencies.

Two options for doing the role playing are suggested. In the first, students choose one or more foundations to demonstrate and develop their own examples. In the second option, students draw an example from one of the foundations—similar to a game of charades. If the second option is chosen, instructors will need to select examples and prepare strips of paper with the examples for students to choose from.

In the “Deeper Understanding” section, students are asked to identify considerations when working with children with disabilities or who are dual language learners. If students do not have much experience with children with disabilities, two resources listed in Appendix D of the *California Preschool Curriculum Framework, Volume 1* are suggested: *Adapting Early Childhood Curricula for Children with Special Needs*



(Seventh edition) by Ruth E., Cook, M. Diane Klein, and Annette Tessier and *Inclusive Early Childhood Education: Development, Resources, and Practice* (Fifth edition) by Penny Low Deiner.

Note: The eighth edition of *Adapting Early Childhood Curricula for Children with Special Needs* by Ruth E. Cook, M. Diane Klein, and Deborah Chen was published in 2011. The sixth edition of *Inclusive Early Childhood Education: Development, Resources, and Practice* by Penny Low Deiner was published in 2013.

The California Department of Education publication *Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning* (Second edition) may be useful for students in learning more about working with children who are dual language learners.

Information Delivery



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There are four strands in the science domain, and a summary table of the strands, substrands, and number of foundations for each substrand is on page 59 of the *California Preschool Learning Foundations, Volume 3*. The table is also presented here for quick reference:

Strand	Substrand	Foundation
Scientific Inquiry	1.0 Observation and Investigation	1.1
		1.2
		1.3
		1.4
		1.5
		1.6
	2.0 Documentation and Communication	2.1
		2.2
Physical Sciences	1.0 Properties and Characteristics of Nonliving Objects and Materials	1.1
	2.0 Changes in Nonliving Objects and Materials	2.1
		2.2



Strand	Substrand	Foundation
Life Sciences	1.0 Properties and Characteristics of Living Things	1.1
		1.2
		1.3
		1.4
Life Sciences	2.0 Changes in Living Things	2.1
		2.2
Earth Sciences	1.0 Properties and Characteristics of Earth Materials and Objects	1.1
		2.1
	2.0 Changes in the Earth	2.2
		2.3
		2.4

A glossary for the science domain is on pages 95–96 of the *California Preschool Learning Foundations, Volume 3*, and the glossary terms are in bold throughout the science domain chapter.

Active Learning

Getting it started

Begin by asking students to read pages 48–60 and pages 95–96 of the *California Preschool Learning Foundations, Volume 3*. Instructors may wish to make this assigned out-of-class reading so that students are prepared to discuss the material in class. An option is to do a jigsaw reading during the class session and assign different pages to one or more students. The students could prepare one-page note sheets that outline the main points and key vocabulary for their assigned sections.

Conclude the reading with a short class discussion that could address these questions:



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- What is critical information that teachers should know about the science foundations?
- What are the key vocabulary terms in this domain that teachers should know?



Keeping it going

Ask students to form teams of two or three depending on the class size. Students will be role-playing, so the number of teams may be determined by how much time is allotted for the role playing and follow-up discussion.

Explain to students that they are to choose one of the foundations from the Physical Sciences, Life Sciences, or Earth Sciences strands and develop an example. They can review the examples provided in the *California Learning Foundations, Volume 3* for ideas but should come up with their own example. They then develop a short role-playing presentation of their example that shows how a child might demonstrate the competencies described in the foundation. Students may gather or make props to use in their presentation.

Putting it together

Each team does its role playing without naming the strand, substrand, or foundation. The other students are asked to identify which foundation from one of the three content strands was presented and also any of the foundations from the Scientific Inquiry strand. If the team feels that the students have not identified the correct content strand foundation, they can repeat or expand on their role playing to give the audience a second chance.

Taking it further

After all the presentations have been done, ask the students to discuss these questions:

- What made it easy or difficult to decide which foundation was being portrayed?
- What similar challenges might occur when observing children to determine their progress in learning the skills or knowledge described in the foundations?
- What might teachers need to know or plan to do to address those challenges?

Another approach/way

Instead of self-selecting a foundation and creating their own examples, the teams could draw one of the examples from the foundations. Students would then have one minute to prepare—similar to charades. However, students can communicate using any language they choose and incorporate props. Other students could also work in their teams to identify the foundation being role-played.



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Reflection

Conclude the class with a group discussion or by asking students to individually respond to these questions:



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- What images or words from any of the role playing are you still thinking about?
- Which foundations did you find it easiest to develop an example for? To identify? Which were the most difficult to develop? To identify?
- What additional considerations should teachers be aware of when observing children to see how they may be demonstrating the knowledge and skills described in the science foundations?
- What will you take from this learning experience to your work on the science foundations with young children?

Deeper Understanding



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Have students review the sections on universal design for learning and children whose home language is not English (*California Preschool Learning Foundations, Volume 3*, pp. xiv–xv, 51–52, and 53–54). Ask them to discuss how children with different disabilities or who are learning English might demonstrate competence in a foundation.

Then ask the students to revise their role playing to show how children who are dual language learners or have a physical, sensory, cognitive, or language disability could demonstrate a knowledge or skill addressed in the foundation. If students have not had much experience working with children with disabilities or who are dual language learners, you may want to provide resources for students.

These two resources are listed in Appendix D of the *California Preschool Curriculum Framework, Volume 1*:

- *Adapting Early Childhood Curricula for Children with Special Needs* (Seventh edition) by Ruth E., Cook, M. Diane Klein, and Annette Tessier.
- *Inclusive Early Childhood Education: Development, Resources, and Practice* (Fifth edition) by Penny Low Deiner.

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Students could role-play their revised examples or write summaries of the revisions and key considerations when applying the foundations to children who are dual language learners or have disabilities. These revisions could also be shared with other students as a resource.

Online Options

If students write the examples, these could be posted online. After instructor review, students could save all the examples as a future resource.