



Science: Identifying Family and Cultural Connections to the Science Foundations

Focus Statement

Students identify ways that children's experiences and activities in their homes and communities support their acquisition of the competencies addressed in the science 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.

- Child, Family and Community
- 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 resource tool
- Interview
- Pairs and small groups
- Peer review and feedback
- Personal reflection
- 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.

- Culture, Diversity, and Equity
- Family and Community Engagement
- Learning Environments and Curriculum
- Leadership in Early Childhood Education
- Professionalism



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Science Domain:
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Before You Start

“Children are different from one another and vary in their abilities, family and socioeconomic background, home experiences, and cultural heritage and values. Therefore, they may vary in the way they develop and display the knowledge and skills described in the foundations” (*California Preschool Learning Foundations, Vol. 3, p. 51*).

Just as children are different in the way they acquire the competencies addressed in the science foundations, families also may have very different ideas about what science in the preschool classroom means. Some families may think that science is field trips to science-themed museums or doing simple experiments such as seeing what objects float or don't float. They may not consider their children's play with sand and water or interest in finding things for their toy cars to roll down as science.

In this learning experience, students will review the preschool science foundations and think of examples of how children might demonstrate the knowledge and skills addressed by the foundations in their home and community settings. After developing several examples, students will write an article for a family newsletter that explains the foundations to families and incorporates some of the examples.

If students do not have hard copies of the *California Preschool Learning Foundations, Volume 3*, they can download the publication from the California Department of Education Web site at <http://www.cde.ca.gov/sp/cd/re/psfoundations.asp#psfoundvol3>.

The number of sets of foundations for students to review will depend on how instructors assign the foundations to individual or groups of students. Instructors may wish to provide students with the option of bringing hard copies of the foundations or a laptop computer or other digital device that has a copy of the foundations loaded on it.

If instructors use the carousel approach for students to list their examples, it is recommended to prepare the sheets ahead of class. Each sheet will have one foundation written at the top—strand name, substrand name, and foundation number—so 20 sheets will be needed. A list of the foundation numbers by strand and substrand is provided in the “Information Delivery” section of this learning experience.

Students will be creating newsletter articles or notes to families or developing a presentation. Instructors may want to do part of this learning experience at one class session and then give students out-of-class time to prepare their articles, notes, or presentations.



Information Delivery



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Students will work with the science foundations and examples on pages 61–83 of the *California Preschool Learning Foundations, Volume 3*. The following table summarizes the number of foundations by strand and substrand. Instructors may wish to refer to this table when assigning the foundations to students.

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



Strand	Substrand	Foundation
Earth Sciences	2.0 Changes in the Earth (continued)	2.4

Active Learning



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Getting it started

Students begin this learning experience by reading the examples in all the foundations and identifying those that could be observed at children's homes or in other community settings. Students can work individually or in pairs or small groups, and instructors could ask them to review all the foundations or assign specific foundations to each student or group of students.

Keeping it going

Continue by asking students to develop several additional examples for each foundation. These examples should describe children demonstrating a foundation in their home or community. Encourage the students to think of as many different kinds of behaviors as possible and to consider characteristics such as different kinds of home settings, types of communities, cultural beliefs and practices, languages, and seasons.

If the instructor assigned specific foundations to students, they could come up with examples for the foundations they already reviewed. Or instructors could have all the students work on all the foundations by using a carousel approach. Write the strands, substrands, and foundation numbers on the tops of sheets of paper, one strand/substrand/foundation per sheet. Then give one sheet to each student or group of students, and the students write an example on the sheet. Then after a few minutes, students pass the sheet to another student until all the sheets have several examples on them. The number of times the students pass the sheets will depend on the number of students and the amount of class time available.

Online Options

If the class has document-sharing capability, students could post their examples online. The documents would need to have the foundations identified so that students could post their examples under the correct foundations.

Putting it together

At this point ask students to form pairs or small groups if they have not already done so. Each group is to review the list of examples generated for a foundation. They are to group any examples that



seem similar and rewrite the example if needed. They then choose three to five examples that represent different ways children are demonstrating competency in that foundation and reflect varying family and cultural beliefs and practices.

Taking it further

Students now create a newsletter article or note for families that describes what science in their preschool class is about, explains the foundation, and includes examples of how they might see their children demonstrating the foundation at home or in their community. Students could include a photo or drawing.



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Students share their work by either passing the articles or notes around the class until all students have reviewed all the articles or by reading their articles/notes to the rest of the class. Whichever approach is used, encourage students to take notes on the words, ideas, examples, and design of the articles or notes.

Online Options

Students could post their articles or notes online. They could then complete an individual reflection using the questions in the “Reflection” section.

Another approach/way

Instead of writing an article or note, students could develop a short presentation that a teacher might do at a back-to-school night. Students include the same information in the presentation that they were to put in the newsletter article or family note.

Reflection

The following questions could be used for a closing discussion or individual reflection:



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- What words, ideas, examples, or design features stood out from your review of all the articles?
- Which examples seemed familiar to you? Which ones were very different from your prior experiences with children and families?
- How did creating examples and writing the articles (or developing presentations) increase your awareness and understanding of the diversity of family, community, and cultural backgrounds and experiences that children have that relate to the science foundations?
- What considerations will you keep in mind when applying the science foundations to your work with children and families?



Deeper Understanding

Ask students to share their articles or notes with parents of preschoolers. If possible, students should show the parents three or four different articles—possibly one for each of the science strands. Students can explain that they are interested in finding out what families think about science in the preschool and different families' beliefs, cultures, and practices that teachers should consider in helping children learn science.



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Students then interview the parents about their impressions of the articles:

- What in the article or note stands out to you?
- What do you like about the article?
- What parts of the article are not clear?
- What did you learn about science and children from this article?
- What are some recommendations for improving the article? What other considerations about your family and community would you like to share that teachers should keep in mind when teaching science?

Online Options

Students could write up their interviews with the parents and post these online as resources for other students after instructor review.

If instructors ask students to write up their interviews, be sure to have students get the parents' permission to share their comments. Instructors might also suggest that parents have the option of being anonymous if the interviews are shared.