CDE/ECE Faculty Initiative Project Instructional Guide

California Preschool Learning Foundations,
Volume 3 (2012)

Science Domain
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California Preschool Learning Foundations, Volume 3 (PLF, V3)

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PowerPoint Presentations

- PowerPoint presentations are available for each domain by learning experience.
This instructional guide for the science domain is organized to support faculty in addressing the content and research base of the science 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. In the instructional guides, the word “students” refers to college students and not children in the preschool setting.

The guide is not intended to support faculty in helping students learn to assess children’s learning and development related to the science foundations. It is also not intended to support faculty in helping students learn how to design curriculum related to children’s development of science knowledge and skills. Curriculum development is addressed in the instructional guides for the California Preschool Curriculum Framework, Volume 1 and California Preschool Curriculum Framework, Volume 2.

Instructional guides have been developed for these publications:

- California Preschool Learning Foundations, Volume 1
- California Preschool Learning Foundations, Volume 2
- California Preschool Curriculum Framework, Volume 1
- California Preschool Curriculum Framework, Volume 2

These instructional guides are available on the Faculty Initiative Project Web site, http://www.wested.org/facultyinitiative.

The science domain of the California Preschool Learning Foundations, Volume 3 consists of four strands, each with two substrands:

Scientific Inquiry
- 1.0 Observation and Investigation
- 2.0 Documentation and Communication
Physical Sciences

- 1.0 Properties and Characteristics of Nonliving Objects and Materials
- 2.0 Changes in Nonliving Objects and Materials

Life Sciences

- 1.0 Properties and Characteristics of Living Things
- 2.0 Changes in Living Things

Earth Sciences

- 1.0 Properties and Characteristics of Earth Materials and Objects
- 2.0 Changes in the Earth

The learning experiences in this instructional guide allow faculty to address all the strands in an integrated approach or to focus on individual strands.

Because Volume 3 of the foundations completes the publication of California’s early learning and development foundations, there are a number of learning experiences that refer back to domains of learning and development that are found in previous volumes. Wherever possible, relevant page numbers as well as possible connections to the domains in California Preschool Learning Foundations, Volume 1 and California Preschool Learning Foundations, Volume 2 are provided.

When the Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning—A Resource Guide (Second Edition) and the first volumes of the California Preschool Learning Foundations and the California Preschool Curriculum Framework were published, the terms “preschool English learners” and “English-language development” were used. Please note that this instructional guide is using the term “young dual language learners” instead of “preschool English learners” or “young English language learners” in order to be consistent with the current policy of the California Department of Education/Early Education and Support Division (formerly Child Development Division). However, the domain in the foundations and curriculum frameworks is still referred to as the “English-language development” domain.


Student Learning Outcomes

To support faculty in decisions regarding how and where they can best use the California Preschool Learning Foundations, Volume 3 in their course work or across their program, the Student Learning Outcomes (SLOs) developed by the Curriculum Alignment Project (CAP) (http://www.childdevelopment.org/cs/cdtd/print/htdocs/services_cap.htm) for the eight core lower division early childhood courses have been mapped onto each learning experience in this instructional guide for consideration. At the beginning of each learning experience, the Preview of the Learning Experience will provide the list of courses that have been mapped onto the specific learning experience.
The Curriculum Alignment Project's SLOs, objectives, and examples of course content and topics indicated for this instructional guide for the California Preschool Learning Foundations, Volume 3 can be found in Appendix A of this instructional guide. Refer to Appendix A of this instructional guide for detailed and specific student learning outcomes, objectives, and examples of course content and topics. Refer to the Student Learning Outcomes Index for an overview of this instructional guide mapping listed by domain. The location of the SLO Index is listed in the Table of Contents for this instructional guide.

These SLOs are organized by the CAP core lower division early childhood courses. This is not an exhaustive list, and faculty might find ways to use the learning experiences to address SLOs in ways other than what has been indexed. Working through these selected learning experiences does not guarantee the achievement of any student learning outcome or objective; it is understood that students achieve student outcomes through repeated engagement with information and experiences that build competence.

To assist faculty in using these SLOs as supports for decision making, the instructional guide learning experiences are indexed first by California Preschool Learning Foundations, Volume 3 domains and then by CAP courses and SLOs so that faculty can select what is most relevant to their particular needs. Student learning outcomes are matched to specific learning experiences in the instructional guide that will support attainment of that outcome. Not all student learning outcomes map onto the specific content of the instructional guide.

Refer to the Student Learning Outcomes Index for an overview of this instructional guide mapping listed by domain. Refer to Appendix A of this instructional guide for more detailed and specific student learning outcomes, objectives, and examples of course content and topics.

**Instructional Methodologies**

Each learning experience is written to include a variety of instructional methodologies. This is intended to provide varied learning experiences for students as they encounter the foundations. It also provides another variable for faculty to use in deciding which learning experiences will best suit the needs of their students and programs. In this instructional guide, these methodologies are identified for each learning experience and are indexed so that faculty can get an overview of which methodologies are used across
all the learning experiences. The location of the Instructional Methodologies Index is listed in the Table of Contents for this instructional guide. This index in this instructional guide also includes, for the first time, working definitions of each of the instructional methodologies used across the learning experiences.

**California Early Childhood Educator Competency Areas**

The Faculty Initiative Project will undertake a comprehensive process in the future to map the content of the instructional guides to the California Early Childhood Educator Competencies. In this instructional guide, competency areas are listed for each learning experience that could be addressed in the learning experience. This list can be found at the beginning of each learning experience on the page(s) labeled Preview of Learning Experience 1 and so forth. These are preliminary connections and are not meant to be exhaustive. Faculty will find more connections in their courses to both competency areas and competency contexts as they become more familiar with them. They are listed in this instructional guide as an initial exploration of how particular competency areas might be addressed through these learning experiences. There is no index for them in this instructional guide due to the preliminary nature of the mapping.

**Learning Experiences and Instructional Themes**

The instructional guide is composed of 25 learning experiences that can be used to support students in learning about the foundations in the California Preschool Learning Foundations, Volume 3. They are presented by domain, and each learning experience is designed to address one of six instructional themes:

- Helping students connect to their own experiences with the domain
- Learning the content of the domain foundations
- Understanding the rationale and research base of the domain
- Connecting the domain to children’s families and cultural communities
- Exploring the foundations in the early care and education setting
- Connecting the foundations across domains

These themes are not explicitly identified within each learning experience. Because of the holistic nature of development for children and for students, many of the learning experiences cross themes. Nevertheless, to support faculty decision making, the dominant theme for each learning experience is identified in the Organizational Chart for the Instructional Guide for the California Preschool Learning Foundations, Volume 3.
Structure of the Learning Experiences in the *Instructional Guide for the California Preschool Learning Foundations, Volume 3*

**Preview Page(s) Overview**
Each learning experience is introduced with a preview page(s) containing information that will help faculty get an overview of that learning experience. Each of these Preview of Learning Experience page(s) contains

- a focus statement that describes what students will experience in the learning experience,
- a list of the Curriculum Alignment Project (CAP) courses for which CAP student learning outcomes have been mapped onto the learning experience,
- a list of the instructional methodologies used in the learning experience, and
- a list of possible California Early Childhood Educator Competency Areas to consider that could be addressed in this learning experience.

**Before You Start: Information For Preparation**
Following the Preview of Learning Experience page(s), each learning experience begins with a section titled *Before You Start*. This section can be found on the first page of every learning experience following the preview page(s) and provides an overview to help faculty decide if this learning experience fits into their purpose and goals for a class session. In this section there might also be prior readings, background information, connections to other Early Education and Support Division (formerly Child Development Division) publications, or logistical details to consider before engaging with students.

**Instructional Components**

*Information Delivery*
This component is designed to introduce specific content to students in the class setting. The delivery of information may be brief or long and may be composed of a single topic or several related topics. *Information Delivery* might include these elements:

- Lecture content
- Readings or video
- Direct engagement with content in an active way

*Active Learning*
This component describes learning sessions that can be conducted within the time frame of a single class or over several class sessions by individuals, pairs, small groups, or the whole class. These learning sessions are intended to be active,
thoughtful, challenging, and relevant to the content. Active learning is further divided into these segments:

- **Getting it started**
- **Keeping it going**
- **Taking it further**
- **Another approach/way**

Not every learning experience contains all of these segments of active learning. They are included when they are relevant and enhance learning or instructional possibilities.

**Reflection**
Questions for reflection are offered that will challenge students to reflect on their experiences with the content and process of the learning experience. These questions usually ask students to reflect on their experiences and then come to some action or make a decision based on those reflections. This is intended to establish habits of reflection in students that can be carried over to their work with colleagues and young children and families.

**Deeper Understanding**
Topics for additional study or research by students are included at the end of some learning experiences. Again, these are included as they are relevant and will enhance or extend learning. They are intended to take students into deeper engagement with the concepts, issues, and/or research base that are related to the content of the domain.

**Online Options**
Suggestions are made for ways to implement or adapt active learning to student work that is done online. This might be in online courses or as online assignments for face-to-face courses. These are not meant to be exhaustive but to indicate the kinds of adaptations that can be made to support faculty and students who work online.

**PowerPoint Presentations**
Throughout the instructional guide, you will sometimes see this symbol in the left margin of the instructional components. This symbol indicates that there are PowerPoint slides that correspond to a particular part of the learning experience.

**Additional Thoughts**
The learning experiences in this guide are written to be adapted and, therefore, are not intended to be used as scripts. Each learning experience provides a framework within which faculty will need to plan and reflect on what will work best with their particular students.
The California Department of Education has published a resource guide titled *Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning—A Resource Guide (Second Edition)*. 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 their own students who are learning about the foundations and the language of early care and education. The Faculty Initiative Project has produced an instructional guide for this publication, the *Instructional Guide for the Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning—A Resource Guide (Second Edition)*, which is available online at [www.wested.org/facultyinitiative/pelguide.html](http://www.wested.org/facultyinitiative/pelguide.html).
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Map of the Foundations

Science

1.0 Observation and Investigation

At around 48 months of age

1.1 Demonstrate curiosity and raise simple questions about objects and events in their environment.

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<td>Wondering why the toy car does not roll down the ramp, picks up the car and discovers that it is missing one wheel.</td>
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<tr>
<td>When building with blocks, puts more and more blocks on top to find out how tall the tower can get without falling apart.</td>
</tr>
<tr>
<td>Participates in preparing play dough, and asks, “How did it turn blue?”</td>
</tr>
<tr>
<td>Sees a snail and wonders, “Why is it hiding inside?” When is it coming out?”</td>
</tr>
<tr>
<td>A child who is nonverbal gestures to his friend to join in observing how the guinea pigs (the class pets) eat their food. He points, on his communication board, to the photo of a child eating and then points to the guinea pigs.</td>
</tr>
<tr>
<td>During lunchtime, mixes her sour cream with applesauce, and notices that sour cream changes its color. Then she takes out to find out what it tastes like.</td>
</tr>
<tr>
<td>Picks up small “toy” bugs from under a rock and asks, “Why do they roll up in a ball?”</td>
</tr>
</tbody>
</table>

At around 60 months of age

1.1 Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>When playing in the block area, creates a sloped ramp with blocks and rolls different toy cars down the ramp. Checks which car goes the farthest when rolling down the ramp.</td>
</tr>
<tr>
<td>While digging in the mud, sees a worm and wonders, “Does it live in the ground? I see another one. Is it their home? Another child observes the worm and asks, “Why does the worm not have eyes? How does it see to move?”</td>
</tr>
<tr>
<td>On the playground, looks up and asks the teacher, “How come I can see the moon in the daytime?”</td>
</tr>
<tr>
<td>Observes a ladybug in the yard and asks what would happen if she put it in a box with dirt and grass. Asks, “Can it be our class pet?”</td>
</tr>
<tr>
<td>While sorting different rocks, picks up one of the rocks and washes it with soap and water. Then gets the magnifying glass to observe it more closely.</td>
</tr>
<tr>
<td>On a nature walk in the preschool yard, notices holes in the ground, points to the holes and calls out to get the teacher’s attention, and asks, “What’s there?”</td>
</tr>
</tbody>
</table>
Focus Statement

Students become familiar with the science foundations by identifying examples of the science domain content from childhood experiences, recent discoveries, and topics of interest.

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 of Teaching Young Children
- Teaching in a Diverse Society
- Practicum-Field Experience

Instructional Methodologies

- Brainstorming
- Class discussion
- Creation of a visual representation
- Pairs or small groups

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
• Professionalism
Before You Start

The introduction to the science domain tells us that “... scientific content in preschool should be based on children’s existing intuitive knowledge and interests related to science and on concepts children can explore directly in their everyday environment (California Preschool Learning Foundations, Volume 3, p. 55).”

This learning experience is intended to support students in recognizing that science is a part of our everyday lives, just as it is a part of the everyday lives of young children. The focus in this experience is on the three content strands of this domain: Physical Sciences, Life Sciences, and Earth Sciences. Connecting to the content of the Scientific Inquiry strand is done in this instructional guide in Learning Experience 2 of this domain titled “Connecting to Children's Experiences with Scientific Inquiry Through Ramp Exploration.”

As instructors work through this learning experience, it might be helpful to acknowledge and affirm that students will have differing experiences and levels of knowledge relating to the strands being explored here. This is similar to what is found with children in the early care and education setting, and it will be important to point out to students that they have probably learned a great deal from each other in their conversations, as children will also in their explorations with other children and adults.

It will also be important to note and point out the role of language in these experiences and to think about what that might mean for dual language learners or for children with disabilities as they demonstrate the behaviors described in the foundations. Similarly, cultural and community backgrounds may shape the way in which children understand scientific concepts. Be familiar with the section in the introduction to this domain that begins on page 51 of the California Preschool Learning Foundations, Volume 3 entitled “Individual, Cultural, and Linguistic Variations.” Instructors might see these variations in students as they work through this learning experience.

A sample handout, Handout 1, included with this learning experience, is for students use when listing examples from their experiences with the substrands in the science domain. An electronic version of this handout will be available when this instructional guide is online at www.wested.org/facultyinitiative.

The second sentence in the introduction to the science foundations states “Young children, like scientists, have a sense of wonder and...
natural curiosity about objects and events in their environment (California Preschool Learning Foundations, Volume 3, p. 48)."

Explore the descriptions of the strands in the science domain that are presented in the introduction to the domain. These descriptions present the concepts that relate to “. . . children’s existing intuitive knowledge and interests related to science and on concepts children can explore directly in their everyday environment (California Preschool Learning Foundations, Volume 3, p.55).” This will help students understand the content of the domain in relation to the exercise and discussion in the "Active Learning" segment.

Physical Sciences
The following descriptions will be found on pages 56 and 57 of the introduction to the science domain in the California Preschool Learning Foundations, Volume 3:

- Properties of objects, such as sound, light and shadow, weight, flexibility, and different materials, including solid and nonsolid substances
- Changes in objects such as taking apart, combining and mixing, changing from solid to liquid
- Movement of objects such as in pushing, rolling, throwing
- Relationship of properties to movement such as pushing heavy objects versus pushing light objects

Life Sciences
The following descriptions can be found on pages 57 and 58 of the introduction to the science domain in the California Preschool Learning Foundations, Volume 3:

- Properties and characteristics of living things, such as the difference between living and nonliving things, appearances, habitats, behaviors, and changes and growth over time
- Beginning understanding that all living things (humans, plants, animals) have basic needs such as food and water

Earth Sciences
The following descriptions can be found on pages 58 and 59 of the introduction to the science domain in the California Preschool Learning Foundations, Volume 3:

- Characteristics and properties of earth materials such as rocks, soil, air, and water in children’s immediate environments
• Exploration (observing, describing, and documenting) changes in the earth, including the tracking of objects in the sky such as the sun, moon, stars

• Tracking of weather and seasons

**Getting it started**
Divide students into pairs or triads. Ask each pair or triad to work with the three strands of Earth Sciences, Physical Sciences, and Life Sciences.

Ask students to come up with some ideas in each domain for the following three categories that are on the handout:

1. Write down something they know about from their childhood in relation to these concepts.
   For example, in relation to Earth Sciences, what do they know about objects in the sky, kinds of rocks, or what pollutes water or tides.

2. Briefly describe a recent discovery relating to the concepts in any of these three strands.
   For example, in relation to Physical Sciences, they might have recently discovered how to move a heavy object or they might have discovered that moving around in a space such as an auditorium or classroom or changing locations affected the way they could hear something.

3. Briefly describe something they are curious about in relation to these concepts.
   For example, in relation to the Life Sciences, they might wonder why there seem to be increasing numbers of coyotes in urban areas or about the nutritional value of the foods in some restaurants.

**Keeping it going**
Ask each pair or triad to make a list of as many examples as they can think of for each of these questions. Suggest that students take 10–15 minutes to complete this process. Ask students to write their examples on large Post-it® Notes so that they can be posted for all to read.

When they have finished this, organize their results for each domain for each question in some way so that everything is visible to all students. A large chart paper for each question in each strand would work for this.
When students can see all responses, ask the following questions:

- Where are there similarities?
- Are there differences relating to experiences in urban, rural, coastal, or mountain settings or experiences?
- Which responses reflect experiences in formal schooling and which reflect experiences in everyday lives?
- Are values or cultural differences in beliefs about natural events and materials reflected in the responses?
- What do these responses suggest about working with these domains in early care and education settings?

**Online Options**

Students could post their completed handouts online. Students would then review all the handouts and write individual responses to the questions. These responses would be submitted to the instructor. If the class has online-discussion capability, an instructor led class discussion of the responses could occur online.

**Taking it further**

Ask students to develop a visual representation of one of their experiences. Each pair could choose one of their examples and do a drawing, painting, collage, sculpture or creation from any other media that might be available. Develop a gallery for display.
## Exploring Our Personal Connections to Physical Sciences, Life Sciences, and Earth Sciences

<table>
<thead>
<tr>
<th>Science Domain</th>
<th>Something I learned as a child</th>
<th>Something I recently discovered</th>
<th>Something I am curious about</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrand: Properties and Characteristics of Nonliving Objects and Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrand: Changes in Nonliving Objects and Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Life Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrand: Properties and Characteristics of Living Things</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrand: Changes in Living Things</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earth Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrand: Properties and Characteristics of Earth Materials and Objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substrand: Changes in the Earth</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Science

“Young children, like scientists, have a sense of wonder and natural curiosity about objects and events in their environment (California Preschool Learning Foundations, Volume 3, p. 48).”

California Preschool Learning Foundations
Volume 3
CALIFORNIA DEPARTMENT OF EDUCATION • 2013
Science

The science foundations include content based on “…children’s existing intuitive knowledge and interests related to science and on concepts children can explore directly in their everyday environment.”

(\textit{California Preschool Learning Foundations, Volume 3, p. 55})

Science

\textbf{Physical Sciences} foundations explore:

• Properties of objects (sound, light and shadow, weight, flexibility) and different materials including solid and nonsolid substances.
Science

**Physical Sciences** foundations explore:

- Changes in objects (taking apart, combining and mixing, solid to liquid).
- Movement of objects
- Relationship of properties to movement such as pushing heavy versus light objects.

Science: Learning Experience 1

**Life Sciences** foundations explore:

- Properties and characteristics of living things, such as the difference between living and nonliving things, appearances, habitats, behaviors, and changes and growth over time.
- A beginning understanding that all living things (humans, plants, animals) have basic needs such as food and water.
Science

**Earth Sciences** foundations relate to:

- Characteristics and properties of earth materials such as rocks, soil, air, and water in children’s immediate environments.
- Observing and describing changes in the earth, such as in objects in the sky like the sun, moon, and stars.
- Tracking of weather and seasons.

---

**Science: Learning Experience 1**

<table>
<thead>
<tr>
<th>Physical Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrand: Properties and Characteristics of Nonliving Objects and Materials</td>
</tr>
<tr>
<td>Substrand: Changes in Nonliving Objects and Materials</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Life Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrand: Properties and Characteristics of Living Things</td>
</tr>
<tr>
<td>Substrand: Changes in Living Things</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Something I learned as a child</th>
<th>Something I recently discovered</th>
<th>Something I am curious about</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Science

- Where are there similarities?
- Are there differences relating to experiences in urban, rural, coastal, or mountain settings or experiences?
- Which responses reflect experiences in formal schooling and which reflect experiences in everyday lives?

Science

- Are values or cultural differences in beliefs about natural events and materials reflected in the responses? What do these responses suggest about working with these domains in early care and education settings?
Science: Connecting to Children’s Experience with Scientific Inquiry Through Ramp Exploration

Focus Statement

Students explore the Scientific Inquiry strand by experiencing firsthand an activity that children often do in early care and education settings—playing with ramps. Students will identify and reflect on the different elements of scientific inquiry they use during their play.

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, Growth, and Development
- Introduction to Curriculum
- Principle and Practices of Teaching Young Children
- Observation and Assessment
- Practicum-Field Experience

Instructional Methodologies

- Pairs or small groups
- Problem solving
- 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.
- Child Development and Learning
- Observation, Screening, Assessment, and Documentation
- Learning Environments and Curriculum
Science:
Connecting to Children’s Experience with Scientific Inquiry
Through Ramp Exploration

Before You Start

This learning experience gives students a chance to experience scientific inquiry as it is described in the science domain. It will help if students have some familiarity with this domain. This can be done through either of the learning experiences in this domain that are designed to acquaint students with this domain. These are Learning Experience 3 “Piecing Together the Science Domain Content Puzzle” and Learning Experience 4 “Exploring the Content and Vocabulary of the Science Domain.”

For this experience, you will need to gather some materials and supplies that students will use to carry out their inquiries. The experience is explored here with a particular example from the Physical Sciences strand of this domain.

There are other examples that can be explored as well, and these will be discussed in the learning experience. For the example described here, the instructor will need the following materials:

• A ramp - This can be made using a board or a piece of strong, smooth cardboard with something to put under one end to raise it up, such as books or a box. It will be helpful to have the ability to set the ramp at different heights and angles.

• Objects and materials that will roll down the ramp - Include objects that will roll such as toy vehicles with rolling wheels that are different sizes and weights, balls of different sizes, marbles, balls of yarn or twine, pencils, plastic bottles, or anything you can find that will roll. Try to include objects that will not all roll at the same rate and some that will not roll in straight lines.

• Materials for students to record predictions and observations - These can be paper and pencil, electronic tablets, or laptops.

Set a tone of curiosity and enjoyment at finding out about things. There is a great deal of room in this activity for creativity on the part of both faculty and students, and be prepared to support and invite that. Students should experience this as a playful activity and then discuss how many of the foundations in the Scientific Inquiry strand they were actually carrying out.
Let students know that they will be building their own connection to the science domain, and especially the strand of Scientific Inquiry, by carrying out their own scientific inquiry. Review the foundations in this strand, either through one of the learning experiences mentioned in the "Before You Start" section or by reading through the foundations in class.

Note these important behaviors that indicate use of scientific inquiry by young children:

- Describing objects and events
- Raising questions about objects and events
- Using observation and measurement
- Comparing and contrasting objects and events
- Making predictions and checking them
- Making inferences and forming generalizations
- Recording information
- Sharing findings and explanations

Getting it started

Let students know that they will be experiencing something that young children experience frequently in their early care and education settings—playing with ramps. This is an activity that engages children in the behaviors of the science foundations during their active play and explorations. Students will be asked to record some of their thinking and observations, but none of these will be collected or reviewed. They are solely for the students' own experience and exploration.

Set up the ramp so that everyone can see it. Form small groups of two to four, depending on the size of the class. Give every group two or three objects. Begin by asking each group to record what they think will happen when they roll their objects down the ramp. Have groups take turns rolling their objects down the ramp. Before each group rolls its objects, the instructor might ask the other groups what they think will happen. Remember to check predictions with the evidence of what did occur.

Keeping it going

Once all the objects have been used, vary the conditions of the ramp rolling. Here is where instructors and students can get creative. Try to come up with ways that objects would not be able to
roll, like changing the height of the ramp, or putting tape on the ramp at intervals to make bumps. Set up races or challenges between objects to see which will go fastest, farthest, or roll off the side.

Instructors can go through the groups again, but perhaps rotate the objects or even bring in some new ones. Ask students to think of other things they have or can find in the room that might roll down the ramp.

Before doing each of these variations, remember to ask students to make predictions and/or compare and contrast the properties of the objects such as size and weight and predict how that will affect their travel down the ramp. Following any of these variations, ask students to give descriptions of what happened and why. Remember that it is the process of inquiry that matters here, and students need not come up with detailed explanations.

**Putting it together**
After they have explored variations and different conditions of this experience, ask students when in this experience they were able to do each of the following skills:

- Describe objects and events
- Raise questions about objects and events
- Use observation and measurement
- Compare and contrast objects and events
- Make predictions and check them
- Make inferences and form generalizations
- Record information
- Share findings and explanations

**Online Options**

Students could work individually or in small groups to conduct their ramp experiments outside of class. Students would then write brief responses to the questions in “Putting it together” and post them online. Students could then compare their own experiences with those of some of their classmates, noting which skills were reported most frequently. If the class has online-discussion capability, instructors could also ask students to discuss what they learned about the scientific inquiry process that relates to young children.
If there were any of these skills that they did not remember doing, ask them to think about times when they might have done them without realizing it. For example, they probably were making inferences and forming generalizations when they explored how weight or size would affect an object rolling down the ramp.

Point out that they have fully explored the Scientific Inquiry strand and also explored much of the strand of Physical Sciences. Instructors might also point out how much language development would be involved and also how many mathematical concepts important to young children were used in this activity.

Ask students to reflect on their experience with the following questions:

- What most surprised you about this exercise?
- What did you enjoy most?
- What did you learn?
- What questions did this exercise raise for you?
- How did this experience affect your ideas about science and young children?

If the class has online-discussion capability, the reflection questions could be discussed online between the students and the instructor.
Science

Scientific Inquiry
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

Physical Sciences
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

Science

Children using scientific inquiry
• Describe objects and events
• Raise questions about objects and events
• Use observation and measurement
• Compare and contrast objects and events
Science

**Children**
- Make predictions and check them
- Make inferences and form generalizations
- Record information
- Share findings and explanations
Science

• What most surprised you about this exercise?
• What did you enjoy most? What did you learn?
• What questions did this exercise raise for you?
• How did this experience affect your ideas about science and young children?
Science: Piecing Together the Science Domain Content Puzzle

Focus Statement

Students become familiar with the content and structure of the science foundations by assembling puzzle pieces of the strands, substrands, and foundations of the domain.

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, Growth, and Development
- Introduction to Curriculum
- Principle and Practices of Teaching Young Children
- Practicum-Field Experience

Instructional Methodologies

- Class discussion
- Pairs or small groups
- Problem solving
- Reflective discussion

California Early Childhood Educator Competency Areas to Consider

The Faculty Initiative Project 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.

- Child Development and Learning
• Special Needs and Inclusion
• Learning Environments and Curriculum
• Professionalism
Before You Start

This learning experience provides students with an opportunity to explore the content and organizational structure of the science domain of the *California Preschool Learning Foundations, Volume 3*. If this is the first time some students are working with the foundations, assembling the puzzle will serve as an introduction to all the foundations because their organizational structures are nearly identical.

Students will be assembling puzzles of the domain elements, and a handout of the pieces (Handout 1) is included if instructors want to reproduce and use it in this learning experience. An electronic version of these puzzle pieces (Handout 1) will be available when this instructional guide is available online at [www.wested.org/facultyinitiative](http://www.wested.org/facultyinitiative). The pieces can be cut and packaged in envelopes prior to the class session. If preferred, instructors can also create their own puzzle pieces by using a large card or half sheet of 8 ½” x 11” paper for each strand, a paper strip for each of the substrands (including the wording “At around 48 months of age” and “At around 60 months of age” on a line below each substrand name), and a paper strip for each of the foundations. The number of puzzle sets needed will depend on how instructors decide to group the students—individually, in pairs, or in small groups.

If instructors have access to several copies of the *California Preschool Learning Foundations, Volume 3*, students could use them to compare their organization of the puzzle pieces with the actual structure of the science strands, substrands, and foundations. Two resources that students can also use to check their work are included with this instructional guide: (1) Handout 2 which lists the science domain strands, substrands, and foundations and (2) a summary of the strands, substrands, and foundations in Appendix B. An electronic version of both of these documents will be available when this instructional guide is online at [www.wested.org/facultyinitiative](http://www.wested.org/facultyinitiative).

There are four strands in the science domain: Scientific Inquiry, Physical Sciences, Life Sciences, and Earth Sciences. The first strand, Scientific Inquiry, is about the skills and specific language related to science. The other strands are about the content areas of science. Each strand has two substrands, and the substrands in the Physical Sciences, Life Sciences, and Earth Sciences are very similar. The first substrand is about properties and characteristics, and the second substrand is about changes. These two substrands represent the two unifying concepts in science. A table
summarizing these strands, substrands, and the number of foundations for each substrand can be found on page 59 of the *California Preschool Learning Foundations, Volume 3*. It is provided here for your reference:

<table>
<thead>
<tr>
<th>Strand</th>
<th>Substrand</th>
<th>Foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Inquiry</td>
<td>1.0 Observation and Investigation</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3</td>
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<td>1.5</td>
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<tr>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>2.0 Documentation and Communication</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>1.0 Properties and Characteristics of Nonliving Objects and Materials</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>2.0 Changes in Nonliving Objects and Materials</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>1.0 Properties and Characteristics of Living Things</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td></td>
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<td>1.3</td>
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<tr>
<td></td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>2.0 Changes in Living Things</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>1.0 Properties and Characteristics of Earth Materials and Objects</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>2.0 Changes in the Earth</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
</tr>
</tbody>
</table>
Strand | Substrand | Foundation
--- | --- | ---
Earth Sciences | 2.0 Changes in the Earth (continued) | 2.4

Summaries of the contents of each strand are found on pages 52–59. If students are not very familiar with the process of scientific inquiry or any of the three science content areas, it may be helpful to review them with the students through lecture or assigned reading and discussion.

### Getting it started

For students who are exploring the *California Preschool Learning Foundations* for the first time, instructors may choose to begin the learning experience by asking them to read the introductory sections on pages xi–xiv of the *California Preschool Learning Foundations, Volume 3*. For example:

- “Introduction” opening paragraphs (pp. xi–xii)
- “Content of this Volume” (p. xii)
- “Organization of the Foundations” (pp. xiii–xiv)

This material provides basic background information about what the foundations are, how they’re organized, and their relation to the *Common Core State Standards*.

After the students have a basic understanding of the purpose and organizational structure of the foundations, introduce the science domain and its strands by asking students to read the section titled “Science Domain” on page xiii or presenting an overview of the four strands. Also be sure that the students understand what the designations “At around 48 months of age” and “At around 60 months of age” mean. Explanations for these designations can be found on page xiii.

### Keeping it going

Show students the puzzle pieces and explain that they are to arrange the pieces to illustrate the organizational structure of the science domain. They can begin by finding the cards with the four strands and continue by placing the appropriate substrands and foundations under each strand. Remind students to also consider...
whether each foundation best fits under the 48 months or 60 months category.

Students can work individually or in a group, but having students work in pairs or a larger group allows for an exchange of ideas as students decide where each substrand and foundation should be placed. Promoting this kind of discussion may also prompt students to engage more fully with the content.

Putting it together
After the puzzles have been completed, ask students to compare their organizational structures with those of other students. Suggest that they look for and discuss any differences. Students can then check their puzzles with the actual organization of the foundations on pages 61–83 or pages 108–112 of the California Preschool Learning Foundations, Volume 3; with Handout 2 for this learning experience; or Appendix B of this instructional guide. If their completed puzzles are different from the organization of the foundations, ask students to explain their choices and consider why the foundations are ordered the way they are.

Taking it further
Ask students to read the foundations and focus on the differences between “At around 48 months of age” and “At around 60 months of age” for the same foundation. Discuss some of the following questions:

- What pattern do you notice between the foundations at the two different age groups?
- If the difference between the foundations at the two age groups is the wording “in greater detail,” “with greater detail,” or “an increased ability to,” how would you decide if a child has acquired the skills and knowledge for the foundation at the 48-month age level or the 60-month age level? What information about the child would you need?

Online Options
If the class has online-discussion capability, an instructor led discussion of the questions and points in this section could occur online with students.

If students have copies of the foundations with the examples, ask them to look at a few examples in each standard. If students do not have copies, ask for volunteers to read aloud the examples for a few foundations from the instructor’s copy of the California Preschool Learning Foundations, Volume 3. Ask students to point out how the examples illustrate the differences in
knowledge and skills that children are able to demonstrate. Discuss what students would need to help them apply the foundations in their work with children.

Another approach/way
Depending on the number of students in the class and the time available for this learning experience, instructors may decide to assign each group of students the substrands and foundations for only one strand rather than all four strands. The groups of students would then present their completed puzzles for their assigned strand to the whole class. Students could compare their work with the actual foundations either before or after the presentations. If students do the comparisons after the presentations, doing this step as a whole class would ensure that all the students see the correct ordering of the foundations.

Reflection

After the students have reviewed and discussed their puzzles, ask them to respond to the following questions:

- As you look at the completed puzzles or organizational structure of the foundations in the science domain, what stands out for you?
- Which specific foundations were easier to place? Why? Which ones were more challenging? Why?
- What are some examples you have seen of any of these foundations?
- Which strand is the least familiar to you? How could you learn more about that strand?
### Science: Putting Together the Science Domain Puzzle

#### Scientific Inquiry

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observation and Investigation</strong></td>
<td></td>
</tr>
<tr>
<td>Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
<td>Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td>Observe objects and events in the environment and describe them.</td>
<td>Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td>Begin to identify and use, with adult support, some observation and measurement tools.</td>
<td>Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td>Compare and contrast objects and events and begin to describe similarities and differences.</td>
<td>Compare and contrast objects and events and begin to describe similarities and differences in greater detail.</td>
</tr>
<tr>
<td>Make predictions and check them, with adult support, through concrete experiences.</td>
<td>Demonstrate an increased ability to make predictions and check them (e.g., may make more complex predictions, offer ways to test predictions, and discuss why predictions were correct or incorrect).</td>
</tr>
<tr>
<td>Make inferences and form generalizations based on evidence.</td>
<td>Demonstrate an increased ability to make inferences and form generalizations based on evidence.</td>
</tr>
</tbody>
</table>
### Documentation and Communication

<table>
<thead>
<tr>
<th>Record observations or findings in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos.</th>
<th>Record information more regularly and in greater detail in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos, or by tallying and graphing information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share findings and explanations, which may be correct or incorrect, with or without adult prompting.</td>
<td>Share findings and explanations, which may be correct or incorrect, more spontaneously and with greater detail.</td>
</tr>
</tbody>
</table>

### Physical Sciences

| Properties and Characteristics of Nonliving Objects and Materials |
|---|---|
| Observe, investigate, and identify the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound). | Demonstrate increased ability to observe, investigate, and describe in greater detail the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound). |

<p>| Changes in Nonliving Objects and Materials |
|---|---|
| Demonstrate awareness that objects and materials can change; explore and describe changes in objects and materials (rearrangement of parts; change in color, shape, texture, temperature). | Demonstrate an increased awareness that objects and materials can change in various ways. Explore and describe in greater detail changes in objects and materials (rearrangement of parts; change in color, shape, texture, temperature). |</p>
<table>
<thead>
<tr>
<th>Observe and describe the motion of objects (in terms of speed, direction, the ways things move), and explore the effect of own actions (e.g., pushing, pulling, rolling, dropping) on making objects move.</th>
<th>Demonstrate an increased ability to observe and describe in greater detail the motion of objects (in terms of speed, direction, the ways things move), and to explore the effect of own actions on the motion of objects, including changes in speed and direction.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Life Sciences</strong></td>
<td></td>
</tr>
<tr>
<td>At around 48 months of age</td>
<td>At around 60 months of age</td>
</tr>
<tr>
<td><strong>Properties and Characteristics of Living Things</strong></td>
<td></td>
</tr>
<tr>
<td>Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
<td>Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
<td>Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
</tr>
<tr>
<td>Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.</td>
<td>Recognize that living things have habitats in different environments suited to their unique needs.</td>
</tr>
<tr>
<td>Indicate knowledge of the difference between animate objects (animals, people) and inanimate objects. For example, expect animate objects to initiate movement and to have different insides than inanimate objects.</td>
<td>Indicate knowledge of the difference between animate and inanimate objects, providing greater detail, and recognize that only animals and plants undergo biological processes such as growth, illness, healing, and dying.</td>
</tr>
</tbody>
</table>
### Changes in Living Things

<table>
<thead>
<tr>
<th>Observe and explore growth and changes in humans, animals, and plants and demonstrate an understanding that living things change over time in size and in other capacities as they grow.</th>
<th>Observe and explore growth in humans, animals, and plants and demonstrate an increased understanding that living things change as they grow and go through transformations related to the life cycle (for example, from a caterpillar to butterfly).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.</td>
<td>Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).</td>
</tr>
</tbody>
</table>

### Earth Sciences

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
</table>

#### Properties and Characteristics of Earth Materials and Objects

| Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air. | Demonstrate increased ability to investigate and compare characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air. |

### Changes in the Earth

<p>| Observe and describe natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change. | Demonstrate an increased ability to observe and describe natural objects in the sky and to notice patterns of movement and apparent changes in the sun and the moon. |</p>
<table>
<thead>
<tr>
<th>Notice and describe changes in weather.</th>
<th>Demonstrate an increased ability to observe, describe, and discuss changes in weather.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin to notice the effects of weather and seasonal changes on their own lives and on plants and animals.</td>
<td>Demonstrate an increased ability to notice and describe the effects of weather and seasonal changes on their own lives and on plants and animals.</td>
</tr>
<tr>
<td>Develop awareness of the importance of caring for and respecting the environment and participate in activities related to its care.</td>
<td>Demonstrate an increased awareness and the ability to discuss in simple terms how to care for the environment, and participate in activities related to its care.</td>
</tr>
</tbody>
</table>
# Science

## Scientific Inquiry

### 1.0 Observation and Investigation

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
<td><strong>1.1</strong> Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td><strong>1.2</strong> Observe objects and events in the environment and describe them.</td>
<td><strong>1.2</strong> Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td><strong>1.3</strong> Begin to identify and use, with adult support, some observation and measurement tools.</td>
<td><strong>1.3</strong> Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td><strong>1.4</strong> Compare and contrast objects and events and begin to describe similarities and differences.</td>
<td><strong>1.4</strong> Compare and contrast objects and events and describe similarities and differences in greater detail.</td>
</tr>
<tr>
<td><strong>1.5</strong> Make predictions and check them, with adult support, through concrete experiences.</td>
<td><strong>1.5</strong> Demonstrate an increased ability to make predictions and check them (e.g., may make more complex predictions, offer ways to test predictions, and discuss why predictions were correct or incorrect).</td>
</tr>
<tr>
<td><strong>1.6</strong> Make inferences and form generalizations based on evidence.</td>
<td><strong>1.6</strong> Demonstrate an increased ability to make inferences and form generalizations based on evidence.</td>
</tr>
</tbody>
</table>

1. Other related scientific processes, such as classifying, ordering, and measuring, are addressed in the foundations for mathematics.

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2.0 Documentation and Communication

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Record observations or findings in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos.</td>
<td>2.1 Record information more regularly and in greater detail in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, photos, or by tallying and graphing information.</td>
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<td>2.2 Share findings and explanations, which may be correct or incorrect, with or without adult prompting.</td>
<td>2.2 Share findings and explanations, which may be correct or incorrect, more spontaneously and with greater detail.</td>
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Physical Sciences

1.0 Properties and Characteristics of Nonliving Objects and Materials

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<th>At around 48 months of age</th>
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<tr>
<td>1.1 Observe, investigate, and identify the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
<td>1.1 Demonstrate increased ability to observe, investigate, and describe in greater detail the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
</tr>
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</table>

2.0 Changes in Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Demonstrate awareness that objects and materials can change; explore and describe changes in objects and materials (rearrangement of parts; change in color, shape, texture, temperature).</td>
<td>2.1 Demonstrate an increased awareness that objects and materials can change in various ways. Explore and describe in greater detail changes in objects and materials (rearrangement of parts; change in color, shape, texture, form, and temperature).</td>
</tr>
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</table>
### 2.0 Changes in Nonliving Objects and Materials (continued)

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2.2 Observe and describe the motion of objects (in terms of speed, direction, the ways things move), and explore the effect of own actions (e.g., pushing, pulling, rolling, dropping) on making objects move.</td>
<td>2.2 Demonstrate an increased ability to observe and describe in greater detail the motion of objects (in terms of speed, direction, the ways things move), and to explore the effect of own actions on the motion of objects, including changes in speed and direction.</td>
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### Life Sciences

#### 1.0 Properties and Characteristics of Living Things

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<tr>
<td>1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
<td>1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>1.2 Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
<td>1.2 Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
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<tr>
<td>1.3 Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.</td>
<td>1.3 Recognize that living things have habitats in different environments suited to their unique needs.</td>
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<tr>
<td>1.4 Indicate knowledge of the difference between animate objects (animals, people) and inanimate objects. For example, expect animate objects to initiate movement and to have different insides than inanimate objects.</td>
<td>1.4 Indicate knowledge of the difference between animate and inanimate objects, providing greater detail, and recognize that only animals and plants undergo biological processes such as growth, illness, healing, and dying.</td>
</tr>
</tbody>
</table>

2. The knowledge of body parts is also addressed in the *California Preschool Foundations (Volume 2)* for health. In science, it also includes the knowledge of body processes. Knowledge of body parts is extended to those of humans and other animals.

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### 2.0 Changes in Living Things

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<td>2.2 Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.</td>
<td>2.2 Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).</td>
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## Earth Sciences

### 1.0 Properties and Characteristics of Earth Materials and Objects

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<tr>
<td>1.1 Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
<td>1.1 Demonstrate increased ability to investigate and compare characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
</tr>
</tbody>
</table>

### 2.0 Changes in the Earth

| 2.1 Observe and describe natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change. | 2.1 Demonstrate an increased ability to observe and describe natural objects in the sky and to notice patterns of movement and apparent changes in the sun and the moon. |
| 2.2 Notice and describe changes in weather. | 2.2 Demonstrate an increased ability to observe, describe, and discuss changes in weather. |
| 2.3 Begin to notice the effects of weather and seasonal changes on their own lives and on plants and animals. | 2.3 Demonstrate an increased ability to notice and describe the effects of weather and seasonal changes on their own lives and on plants and animals. |
| 2.4 Develop awareness of the importance of caring for and respecting the environment and participate in activities related to its care. | 2.4 Demonstrate an increased awareness and the ability to discuss in simple terms how to care for the environment, and participate in activities related to its care. |
Science

Scientific Inquiry
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

Physical Sciences
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences

1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences

1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

<table>
<thead>
<tr>
<th>Science: Learning Experience 3</th>
<th><a href="http://www.wested.org/facultyinitiative/">http://www.wested.org/facultyinitiative/</a></th>
</tr>
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</table>

<table>
<thead>
<tr>
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<td>1.0 Properties and Characteristics of Living Things</td>
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<tr>
<td>2.0 Changes in Living Things</td>
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<td>At around 60 months of age</td>
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<td>1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
</tr>
<tr>
<td>Examples</td>
</tr>
<tr>
<td>- After cutting open a variety of fruits and discovering seeds inside, begins to recognize that fruits have seeds. When asked to predict what is inside an apricot, a child points to a seed and says &quot;seed.&quot;</td>
</tr>
<tr>
<td>- Observes a squirrel climbing up the tree and notices that it has a long tail.</td>
</tr>
<tr>
<td>- On a nature walk in the neighborhood or schoolyard, identifies short plants and tall plants. A child who is an English learner points to or indicates a &quot;Big two.&quot;</td>
</tr>
<tr>
<td>1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>Examples</td>
</tr>
<tr>
<td>- Sorts fruits, such as mangos, avocados, apples, grapes, peaches, and apricots, based on whether they have one seed or many seeds inside. Points to the avocado and apricot and says in the home language, &quot;Look! They both have one big seed.&quot;</td>
</tr>
<tr>
<td>- During circle time, shares that one night they saw coconuts in their yard.</td>
</tr>
<tr>
<td>- Observes and identifies the characteristics of a ladybug (e.g., its shape, size, colors, and how it moves) and shares observations with others when prompted by the teacher, &quot;The ladybug is red and has tiny legs. It has black dots.&quot;</td>
</tr>
</tbody>
</table>
Science

**Completing the puzzle:**

- Assemble the pieces to show the organizational structure of the domain
  - Identify the 4 strands
  - Place appropriate substrands and foundations under each strand
  - Consider whether each foundation describes what children know or can do at around 48 or 60 months of age

**Science**

- What pattern do you notice between the foundations for the two age groups?
- How would you decide if a child has acquired the skills and knowledge for the foundation at the 48-month age level or the 60-month age level? What information about the child would you need?
Science

- What stands out for you?
- Which specific foundations were easier to place? Which ones were more challenging? Why?
- What are some examples you have seen of these foundations?
- Which strand is the least familiar to you? How could you learn more about that strand?
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
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.
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:

<table>
<thead>
<tr>
<th>Strand</th>
<th>Substrand</th>
<th>Foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Inquiry</td>
<td>1.0 Observation and Investigation</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3</td>
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<td></td>
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<td>1.4</td>
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<td></td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>2.0 Documentation and Communication</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>1.0 Properties and Characteristics of Nonliving Objects and Materials</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>2.0 Changes in Nonliving Objects and Materials</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
</tbody>
</table>
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.

### 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:

- 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.
Reflection

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

- 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

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:

- 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 and the sixth edition of Inclusive Early Childhood Education: Development, Resources, and Practice by Penny Low Deiner was published in 2013.
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.
Science

**Scientific Inquiry**
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

**Physical Sciences**
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

**Life Sciences**
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

**Earth Sciences**
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

- 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?
Science

- 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?

Science

- What images or words from 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?
Science

- 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?

“Science is for all students, regardless of age, sex, cultural ethnic background, disabilities, aspirations, or interest and motivation in science.”
(National Committee on Science Education Standards and Assessment and National Research Council 1996, 20)
Science

- Children approach scientific inquiry and explanation having various linguistic, social, and cognitive skills.
- Cultural background may shape the development of some scientific concepts.
- Experiences with the natural world affect children’s understanding of science concepts.

Science

- Many children in California are learning about scientific concepts and skills while acquiring English.
- Some children may communicate their science knowledge and skills using nonverbal means of communication.
Science

Principles of Universal Design for Learning

1. Multiple means of representation
2. Multiple means of expression
3. Multiple means of engagement

Science: Learning Experience 4

- Providing information in a variety of ways so the learning needs of all of the children are met (California Preschool Learning Foundations, Volume 3, pg. xiv).
Science

Principles of Universal Design for Learning

2. **Multiple means of expression**
   ◦ Allowing children to use alternative methods to demonstrate what they know or what they are feeling (California Preschool Learning Foundations, Volume 3, pg. xiv).

Science

Principles of Universal Design for Learning

3. **Multiple means of engagement**
   ◦ Providing choices for activities in the setting or program that facilitate learning by building on children’s interests (California Preschool Learning Foundations, Volume 3, pg. xiv).
Science

Resources:


• *Inclusive Early Childhood Education: Development, Resources, and Practice* (Sixth edition) by Penny Low Deiner.
Science: Linking the Preschool Learning Foundations with the California Kindergarten Science Content Standards

Focus Statement

Students become familiar with the California Department of Education’s *Science Content Standards for California Public Schools, Kindergarten Through Grade Twelve* (California Department of Education, 2000) and explore their relationship to the science foundations in the *California Preschool Learning Foundations, Volume 3*.

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 Growth and Development
- Introduction to Curriculum
- Principles and Practices of Teaching Young Children
- Practicum-Field Experience

Instructional Methodologies

- Class discussion
- Development of resource tool
- 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.
• Child Development and Learning
• Learning Environments and Curriculum
• Leadership in Early Childhood Education
• Professionalism
• Administration and Supervision
Science: Linking the Preschool Learning Foundations with the California Kindergarten Content Standards

Before You Start

As stated on page 50 of the California Learning Foundations, Volume 3, the preschool learning foundations for the science domain are aligned with the Science Content Standards for California Public Schools (California Department of Education, 2000) and the National Science Education Content Standards (National Committee on Science Education Standards and Assessment and National Research Council 1996). In this learning experience, students can explore one or both of these documents and the relationship to the preschool science foundations. It will be important to recognize and to support students in understanding that one is a key California early learning resource and the other is a key national early learning resource.

Appendix B of the California Preschool Learning Foundations, Volume 3 publication is “An Overview of the Alignment of the California Preschool Learning Foundations with Key Early Education Resources.” This is a summary of an alignment document published by the California Department of Education that shows the alignment of all domains of the foundations to three other key California early learning resources, including the kindergarten content standards, and to the Head Start Early Learning and Development Framework. Table 12 on pages 159–160 shows the alignment between the science foundations at the strand and substrand levels and the kindergarten content standards, as well as to the California Infant/Toddler Development Foundations.

There is a learning experience in this instructional guide, titled “Exploring the Overview of the Alignment of the California Preschool Learning Foundations with Key Early Education Resources,” that will support students in exploring all the alignment materials in Appendix B of the California Preschool Learning Foundations, Volume 3 and guide them through the alignment of California foundations in all domains to the other three resources. Therefore, please keep in mind that this learning experience described in the “Active Learning” below relates only to the science foundations and how they are aligned to a specific California resource, Science Content Standards for California Public Schools (California Department of Education, 2000) and a specific national resource, the National Science Education Content Standards (National Committee on Science Education Standards and Assessment and National Research Council 1996).

Students will need access to the California science content standards, and instructors may choose to provide copies of the pages with the kindergarten standards or ask students to download the full document from the California Department of Education’s Web site (http://www.cde.ca.gov/be/st/ss/index.asp). Please note that at the time the
California Preschool Learning Foundations, Volume 3 and this instructional guide were developed, the science content standards adopted by the California Board of Education in 1998 and published by the California Department of Education in 2000 were current. This version is listed under “Previous Content Standards” on the Web page.

If students are also to work with the National Science Education Content Standards, the document can be read online at http://www.nap.edu/openbook.php?record_id=4962&page=R1 or a PDF version can be downloaded at https://download.nap.edu/login.php?record_id=4962&page=/download.php?record_id=4962. Please note that one must register for a free account with The National Academies Press in order to download the document. The registration page is http://www.nap.edu/content/help/mynaphelp.html.

Two handouts, Handout 1 and Handout 2, which students can use in comparing the preschool science learning foundations with the California kindergarten science content standards and the National Science Education Content Standards, are included with this learning experience. Electronic versions of these handouts will be available when this instructional guide is online at www.wested.org/facultyinitiative.

Students are to review and compare two sets of materials in the initial part of this learning experience: the kindergarten content standards of the Science Content Standards for California Public Schools (California Department of Education, 2000) and the science foundations in the California Preschool Learning Foundations, Volume 3.

A summary of the science foundations can be found in Appendix B of this instructional guide as well as in the handouts of these science learning experiences in this instructional guide: Learning Experience 3, “Piecing Together the Science Domain Content Puzzle,” and Learning Experience 4, “Exploring the Content and Vocabulary of the Science Domain.”

The following outline is a summary of the California kindergarten science content standards as adopted by the California State Board of Education in 1998:

Physical Sciences

1. Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:
   a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).
b. *Students know* water can be a liquid or a solid and can be made to change back and forth from one form to the other.

c. *Students know* water left in an open container evaporates (goes into the air) but water in a closed container does not.

**Life Sciences**

2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:
   a. *Students know* how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).
   b. *Students know* stories sometimes give plants and animals attributes they do not really have.
   c. *Students know* how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

**Earth Sciences**

3. Earth is composed of land, air, and water. As a basis for understanding this concept:
   a. *Students know* characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.
   b. *Students know* changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.
   c. *Students know* how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

**Investigation and Experimentation**

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
   a. Observe common objects by using the five senses.
   b. Describe the properties of common objects.
   c. Describe the relative position of objects by using one reference (e.g., above or below).
   d. Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).
   e. Communicate observations orally and through drawings.
Getting it started
This learning experience begins with the students reviewing the California preschool science foundations and the California kindergarten content standards. If this is the students' initial exposure to the science foundations, it may be helpful to spend some time discussing some of the examples for each foundation. Reviewing the glossary on pages 95–96 of the *California Preschool Learning Foundations, Volume 3* may also assist students in understanding the foundations.

Ask students to note the similarities and differences among the substrands and foundations of the three content strands—Physical Sciences, Earth Sciences, and Life Sciences. Discuss what each of the substrands and foundations for the Scientific Inquiry strand could look like for preschoolers, again drawing from the examples as necessary.

Keeping it going
Next introduce Handout 1 or ask students to create a similar grid. Working individually or in small groups, students are to list any foundations that they believe are related to one or more of the kindergarten science content standards. For example, foundation 1.2 of the Scientific Inquiry strand, Observation and Investigation substrand is “Observe objects and events in the environment and describe them.” This foundation could be listed under three elements of the Investigation and Experimentation kindergarten standard: “Observe common objects by using the five senses,” “Describe the properties of common objects,” and “Describe the relative position of objects by using one reference (e.g., above or below).”

<table>
<thead>
<tr>
<th>Investigation and Experimentation</th>
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</thead>
<tbody>
<tr>
<td>4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:</td>
</tr>
<tr>
<td>a. Observe common objects by using the five senses.</td>
</tr>
</tbody>
</table>
Putting it together
The next step is a comparison of the students’ completed grids. Encourage students to look for similarities and differences and to discuss why they did or did not link certain foundations to specific content standards when there are differences. If students worked individually on their grids, instructors may want them to first compare their grids with a few other students before doing a full class discussion.

If students worked in pairs or small groups, instructors may wish to start with a full class discussion. Depending on the size of the class, each pair or group could take a turn sharing the foundations they identified for each standard until all the standards have been compared. Again encourage discussion about any differences in the students’ grids.

Taking it further
Remind students that the preschool science foundations were also organized to align with the National Science Education Content Standards (National Committee on Science Education Standards and Assessment and National Research Council 1996). Review the standards with students, noting that these standards are designated for the grade level groupings K–4, 5–8, and 9–12.

There are eight categories of content standards in the National Science Education Content Standards (National Committee on Science Education Standards and Assessment and National Research Council 1996).

The standards for grade levels K–4 are summarized in the following outline:

<table>
<thead>
<tr>
<th>Strand(s), substrand(s), &amp; foundation(s):</th>
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<tbody>
<tr>
<td>Substrand - 1.0</td>
<td>Substrand - 1.0</td>
<td>Substrand - 1.0</td>
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<tr>
<td>Observation and Investigation</td>
<td>Observation and Investigation</td>
<td>Observation and Investigation</td>
</tr>
<tr>
<td>Foundation – 1.2, 48 and 60 months of age</td>
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<td>Foundation – 1.2, 48 and 60 months of age</td>
</tr>
</tbody>
</table>
Unifying Concepts and Processes (Note that this standard is for grades K-12)
- Systems, order, and organization
- Evidence, models, and explanation
- Change, constancy, and measurement
- Evolution and equilibrium
- Form and function

Science as Inquiry Standards
- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Physical Science Standards
- Properties of objects and materials
- Position and motion of objects
- Light, heat, electricity, and magnetism

Life Science Standards
- Characteristics of organisms
- Life cycles of organisms
- Organisms and environments

Earth and Space Science Standards
- Properties of earth materials
- Objects in the sky
- Changes in earth and sky

Science and Technology Standards
- Abilities to distinguish between natural objects and objects made by humans
- Abilities of technological design
- Understandings about science and technology

Science in Personal and Social Perspectives
- Personal health
- Characteristics and changes in populations
- Types of resources
- Changes in environments
- Science and technology in local challenges

History and Nature of Science Standards
- Science as a human endeavor

Because the standards cover several grade levels, it is important for students to recognize how the standard applies to the youngest
or kindergarten-age children. Reading through the sections titled “Fundamental abilities and concepts that underlie this standard” for each standard may help students identify behaviors that would be typical of kindergartners.

After the review, instructors could ask the students to either (1) respond to questions or (2) complete a comparison grid.

1. Students discuss or write responses to the following two questions:

   Question 1. What are some of the similarities and differences between these national standards and the California kindergarten science standards?

   The following points are examples of some of the similarities and differences and are provided here as a reference for instructors.

   • The grade level designations are different. The California standards are separate for each grade whereas the national ones are for grade level groupings.

   • The number of categories is different; there are eight national standards and four California ones.

   • The titles for some of the standards are the same while others are different.

   • The national standards have a fair amount of detail in classroom vignettes and the fundamental concepts and principles underlying each standard that helps to explain the standards.

   Question 2. How has this review of the National Science Education Content Standards added to your understanding of the preschool science foundations, children’s development of skills and knowledge in the science domain, and the role of
science in the preschool curriculum?

2. Students complete a grid comparing these national standards with the California preschool science foundations. Instructors may choose to give students Handout 2 or ask them to develop their own grids. Students could work individually or in pairs or small groups and then compare and discuss their completed grids.

Online Options
If the class has document-sharing capability, students could complete the comparison grids individually and then share them online. Instructors could review the grids and provide feedback or lead a discussion of the students’ results.

Another approach/way
Instead of having students complete all sections of the grid comparing California’s preschool science foundations and the kindergarten science content standards, instructors may choose to divide the class into small groups and assign each group a certain number of the kindergarten standards and subitems. Then after each group presents its findings, the rest of the class could ask questions and/or suggest additional foundations.

This session can be concluded with a class discussion of the following questions:

- What stood out for you from the comparison of the Science Content Standards for California Public Schools, Kindergarten Through Grade Twelve and the science foundations in the California Preschool Learning Foundations, Volume 3?
- What were some of the main similarities and differences between the standards and the foundations? What might be some reasons for these similarities and differences?
- Why do you think it’s important for preschool teachers to be knowledgeable about the kindergarten science content standards?
- What are key ideas from this learning experience that you’ll keep in mind in your work as a preschool teacher?

Reflection

Deeper Understanding
All 50 states and the District of Columbia have developed early learning guidelines. These guidelines are defined by the Early Learning & Development Standards Web site (http://www.earlylearningguidelines-standards.org/content.php?s=what_are_elgs) as “documents
states have published to describe what children should know and be able to do before they start kindergarten. Some states call their documents ‘early learning standards’ or other titles such as ‘foundations’ or ‘building blocks.’"

Depending on the number of students in the class, instructors may choose to ask students to each review the guidelines related to science from one or more states. They could then develop a resource sheet that might include the following information*:

- State and what the guidelines are called
- Year the guidelines were developed or adopted
- Ages of children addressed
- Purpose and intended use(s) of the guidelines
- Inclusion of guiding principles
- Domains and subjects included
- Summary of the guidelines for science
- Comparison with the preschool science foundations from the *California Preschool Learning Foundations, Volume 3*
- Information that helps you better understand the California preschool science foundations

Students can share the resource sheets with the other students, so that students will have a compilation of state early learning science guidelines as a reference.

### Physical Sciences

1. **Properties of materials can be observed, measured, and predicted.** As a basis for understanding this concept:

   - **a. Students know** objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

   - **b. Students know** water can be a liquid or a solid and can be made to change back and forth from one form to the other.

   - **c. Students know** water left in an open container evaporates (goes into the air) but water in a closed container does not.

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### Life Sciences

**2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:**

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<td>b. Students know stories sometimes give plants and animals attributes they do not really have.</td>
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<td>c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).</td>
<td></td>
</tr>
</tbody>
</table>

**Strand(s), substrand(s), & foundation(s):**

- **Life Sciences**
- **Science Domain**
- **California Preschool Learning Foundations, Volume 3**

May be duplicated for educational purposes only.

Faculty Initiative Project Instructional Guide for the California Preschool Learning Foundations, Volume 3

CDE/Early Education and Support Division (formerly CDD) and WestEd Center for Child and Family Studies

DRAFT July 1, 2014

Learning Experience 5, Handout 1
### Earth Sciences

3. Earth is composed of land, air, and water. As a basis for understanding this concept:

- **a. Students know** characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.
- **b. Students know** changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.
- **c. Students know** how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

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### Investigation and Experimentation

4. **Scientific progress is made by asking meaningful questions and conducting careful investigations.** As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

<p>| | | | | |</p>
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<tbody>
<tr>
<td><strong>a.</strong> Observe common objects by using the five senses.</td>
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</table>
Linking the *National Science Education Content Standards* and the *California Preschool Learning Foundations, Volume 3*

Instructions: After reviewing the eight standards from the *National Science Education Content Standards*, identify some foundations from the science domain that relate to each standard.

<table>
<thead>
<tr>
<th>Unifying Concepts and Processes</th>
<th>Science as Inquiry Standards</th>
<th>Physical Science Standards</th>
<th>Life Science Standards</th>
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<tbody>
<tr>
<td>• Systems, order, and organization</td>
<td>• Abilities necessary to do scientific inquiry</td>
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### Linking the *National Science Education Content Standards* and the *California Preschool Learning Foundations, Volume 3*

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<th>Science and Technology Standards</th>
<th>Science in Personal and Social Perspectives</th>
<th>History and Nature of Science Standards</th>
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</thead>
<tbody>
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<td>• Changes in earth and sky</td>
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</tr>
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Science

The preschool learning foundations for the science domain are aligned with:

- Science Content Standards for California Public Schools (California Department of Education, 2000).
- National Science Education Content Standards (National Committee on Science Education Standards and Assessment and National Research Council 1996).
Science

http://www.cde.ca.gov/be/st/ss/index.asp

Science

http://www.nap.edu/openbook.php?record_id=4962&page=R1
Summary: California Kindergarten Science Content Standards

Physical Sciences

1. Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:
   a) Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

Physical Sciences (continued)

   b) Students know stories sometimes give plants and animals attributes they do not really have.
   c) Students know how to identify major structures of common plants and animals (e.g. stems, leaves, roots, arms, wings, legs).
Summary: California Kindergarten Science Content Standards

Life Sciences

2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:

a) Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).

b) Students know stories sometimes give plants and animals attributes they do not really have.

c) Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).

Science: Learning Experience 5
Summary: California Kindergarten Science Content Standards

**Earth Sciences**

3. Earth is composed of land, air, and water. As a basis for understanding this concept:
   
   a) *Students know* characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.

**Earth Sciences (continued)**

b) *Students know* changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.

c) *Students know* how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.
Summary: California Kindergarten Science Content Standards

Investigation and Experimentation

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations.

4. Students will:
   a) Observe common objects by using five senses.
   b) Describe the properties of common objects.
   c) Describe the relative position of objects by using one reference (e.g., above or below).
Summary: California Kindergarten Science Content Standards

Investigation and Experimentation

d) Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).
e) Communicate observations orally and through drawings.

Preschool Science Foundations

Scientific Inquiry
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

Physical Sciences
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Preschool Science Foundations

**Life Sciences**
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

**Earth Sciences**
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

Science

<table>
<thead>
<tr>
<th>Physical Sciences</th>
<th>Strand(s), substrand(s), &amp; foundation(s):</th>
<th>Strand(s), substrand(s), &amp; foundation(s):</th>
<th>Strand(s), substrand(s), &amp; foundation(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:</td>
<td>a. Students know objects can be described in terms of the materials they are made of (e.g., oily, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking)</td>
<td>b. Students know water can be a liquid or a solid and can be made to change back and forth from one form to the other.</td>
<td>c. Students know water left in an open container evaporates (goes into the air) but water in a closed container does not.</td>
</tr>
</tbody>
</table>
Summary: National Science Education Content Standards

Unifying Concepts and Processes

- Systems, order, and organization
- Evidence, models, and explanation
- Change, constancy, and measurement
- Evolution and equilibrium
- Form and function

http://www.nap.edu/openbook.php?record_id=4962&page=R1
Summary: National Science Education Content Standards

Science as Inquiry Standards
- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Physical Science Standards
- Properties of objects and materials
- Position and motion of objects
- Light, heat, electricity, and magnetism

Life Science Standards
- Characteristics of organisms
- Life cycles of organisms
- Organisms and environments

Earth and Space Science Standards
- Properties of earth materials
- Objects in the sky
- Changes in earth and sky
Summary: National Science Education Content Standards

**Science and Technology Standards**
- Abilities to distinguish between natural objects and objects made by humans
- Abilities of technological design
- Understandings about science and technology

**Science in Personal and Social Perspectives**
- Personal health
- Characteristics and changes in populations
- Types of resources
- Changes in environments
- Science and technology in local challenges
Summary: National Science Education Content Standards

History and Nature of Science Standards

• Science as a human endeavor

Science

• What are some of the similarities and differences between these national standards and the California kindergarten science standards?
Science

- How has this review of the National Science Education Content Standards added to your understanding of the preschool science foundations, children’s development of skills and knowledge in the science domain, and the role of science in the preschool curriculum?
Science

- What stood out for you from the comparison of the Science Content Standards for California Public Schools and the science foundations in the California Preschool Learning Foundations, Volume 3?
- What were some of the main similarities and differences? What might be some reasons for these similarities and differences?

Science

- Why do you think it’s important for preschool teachers to be knowledgeable about the kindergarten science content standards?
- What are key ideas from this learning experience that you’ll keep in mind in your work as a preschool teacher?
Science

- All 50 states and the District of Columbia have early learning guidelines.

- Guidelines can be found on the Early Learning & Development Standards Web site:
  (http://www.earlylearningguidelines-standards.org/content.php?s=what_are_elgs?)

Science: Learning Experience 5

Develop a resource sheet:
- State and what the guidelines are called
- Year the guidelines were developed or adopted
- Ages of children addressed
- Purpose and intended use(s)
- Inclusion of guiding principles
- Domains and subjects included
Science

Develop a resource sheet:

- Summary of the guidelines for science
- Comparison with the preschool science foundations from the *California Preschool Learning Foundations, Volume 3*
- Information that helps you better understand the California preschool science foundations
Science: Exploring the Research Base for the Science Domain

Focus Statement

Students become familiar with the rationale and research base for the preschool science foundations by reviewing the introductory and Bibliographic Notes sections of the science domain and preparing a poster.

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 Growth and Development
- Introduction to Curriculum
- Principle and Practices of Teaching Young Children
- Practicum-Field Experience

Instructional Methodologies

- Class discussion
- Class presentation
- Creation of a visual representation
- Development of resource tool
- Jigsaw reading
- Notetaking outline or guide
- Pairs or small groups
- Peer review and feedback
- Personal reflection
- Reflective discussion
- 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.

- Child Development and Learning
- Learning Environments and Curriculum
- Leadership in Early Childhood Education
- Professionalism
- Administration and Supervision
Science:
Exploring the Research Base for the Science Domain

Before You Start

Children’s predisposition to learn certain kinds of knowledge, and to think abstractly about concepts from biology and physics, support the early learning of science and pave the way for competence in early schooling. Children’s natural inclination and ability to observe and try to understand their world, to develop conceptual knowledge, and to reason about many scientific concepts make science an excellent fit for the preschool environment. As such, there is growing recognition at the national level that science is appropriate and important for preschool children (National Research Council 1999, 2000, 2007) (California Preschool Learning Foundations, Volume 3, p. 48).

As students explore the foundations, acquiring a familiarity with some of the research base can help students better understand the foundations and the differences between the foundations for 48 months and for 60 months. The material in the Bibliographic Notes of the California Preschool Learning Foundations, Volume 3 provides references to the research literature as well as additional information about children’s developmental knowledge and skills for the four strands: Scientific Inquiry, Physical Sciences, Life Sciences, and Earth Sciences.

In this learning experience, students will select one of the strands, review the research citations in the Bibliographic Notes for that strand, and prepare a poster that presents a summary of that information as it relates to the foundations in the strand. It is suggested that time between class sessions be provided for students to work in teams on their posters.

Instructors may choose to develop specific guidelines for the posters or suggest that students review the description of a poster session from the Colorado State University’s Writing Studio, an open-source learning environment—Writing@CSU http://writing.colostate.edu(guides/guide.cfm?guideid=78. In this learning experience, it is suggested that the posters be less technical than those at some professional conference poster sessions and geared for an audience of early childhood educators with varying degrees of experience related to science in the preschool classroom.

Information Delivery

The following sections from the California Preschool Learning Foundations, Volume 3 are referred to in this learning experience:

- Introductory sections to the foundations (pp. 48–60)
Suggestions are made to have students become familiar with these sections through out-of-class reading assignments, jigsaw reading during a class session, or a recap of previous explorations of this material through another learning experience in this instructional guide.

**Getting it started**

Begin this learning experience by asking students to review the introductory sections to the preschool science foundations on pages 48–60 and the glossary on pages 95-96 of the *California Preschool Learning Foundations, Volume 3*. If the students have done Learning Experience 4 in this instructional guide titled “Exploring the Content and Vocabulary of the Science Domain,” remind them of the key points and vocabulary they already identified and discussed. But if this is the first time students are working with the science foundations, students could read the sections outside class or as a jigsaw reading during a class session. Students could work in small groups for the jigsaw approach—each group assigned to one or more of the following sections:

- Introduction, page 48
- Science in Preschool, page 49
- Development of the Whole Child (Science and Other Domains), pages 49–50
- The Preschool Foundations for Science, pages 50–51
- Individual, Cultural, and Linguistic Variations, pages 51–52
- Scientific Inquiry: The Skills and Language of Science, pages 52–53
- Communicating: The Role of Language in Scientific Inquiry, pages 53–55
- Scientific Knowledge: The Content of Science in Preschool, pages 55–56
- Physical Sciences: Early Concepts in Physics, pages 56–57
- Life Sciences: Early Concepts in Biology, pages 57–58
• Earth Sciences: Early Concepts Related to Earth, pages 58–60

After the students have finished their review or done the reading of their assigned sections, ask students to either report on or discuss the following questions:

• What key points did you take from your reading?
• What was some new or unfamiliar vocabulary that you came across?
• Which of the four strands particularly intrigued you?

**Online Options**
If the class has online-discussion capability, instructors could lead an online discussion with students of these three questions.

**Keeping it going**
Next have students form small groups of three or four who expressed interest in the same strand. Depending on the number of students who self-select for each strand, there may be more than one group who will work on the same strand.

Explain to students that they are to read the section of Bibliographic Notes on their strand and then develop a poster that presents some of the research base and rationale for that strand. The posters should be somewhat similar to those seen at conferences or other forums. If students are not familiar with poster sessions, instructors may wish to explain that posters at professional conferences can range from highly technical research and information for an audience of experts on the topic to general information for a varied and more general audience. The posters the students are designing should be developed for an audience of early childhood educators who have a range of expertise and experience in science for preschoolers. The posters should include text and graphics that present highlights from some of the research articles referenced in the Bibliographic Notes and the relationship of the research to specific foundations in the strand.

Because the posters will require time for planning and assembly, consider doing this learning experience over a couple class sessions—perhaps doing the “Getting it started” section as part of one class, assigning the poster to be done out of class, and then having students present their posters during part of a second class.

**Putting it together**
Conduct a poster session as it is done at a conference, allowing students time to view the different posters and interact with the
presenters. Students from each group could take turns remaining with the poster to describe it and answer questions. Allow enough time for the rotations so that all students have an opportunity to look at the posters and be the presenter.

Taking it further
After all the students have reviewed all the posters, conclude the poster session with a class discussion:

- Which elements from the posters stood out for you? Was there one poster that particularly caught your interest? Why?
- What was the easiest part of creating your poster? The most challenging part?
- How did developing a poster help you understand the research and rationale for the strand you selected?
- What other questions came up for you as you reviewed the Bibliographic Notes and prepared your poster?

Another approach/way
Instead of preparing posters for an audience of early childhood educators, ask students to prepare the posters for parents and other family members. The posters would be part of a back-to-school night, and the purpose of the posters is to explain to parents what children will be learning in the science domain based on the foundations.

Students could present their posters as suggested in the “Putting it together” section or each group could present and describe its poster to the rest of the class. If the second approach is used, allow time for the audience to ask questions, point out highlights of the poster, and make one or two recommendations for improving the poster.

Reflection
These questions could be used for individual or group reflection:

- Which facts from the research highlights on the posters do you remember?
- Which facts were familiar? Which ones were new or caused you to have a different perspective?
- What specific information helped you better understand one or more of the preschool science foundations?
- After viewing all the posters for the different strands, which strand other than the one you already selected would you
choose to explore further? What is a first step you will take in that exploration?

Deeper Understanding

Ask students to select three journal references from the list of References and Source Materials on pages 97-101 of the *California Preschool Learning Foundations, Volume 3*. The references should focus on one of the four strands. Ask students to write a short paper that includes summaries of each reference:

- Title and author(s) of the article
- Publication information
- Brief summary of the article
- Key findings that relate to one or more of the foundations in that strand
- How the article supports the student’s understanding of the foundations in the strand

If possible, ask the students to share their summaries or compile them in a way that is accessible to all the students.
Science

*California Preschool Learning Foundations, Volume 3:*
- Introductory sections to the foundations (pp. 48–60)
- Glossary (pp. 95–96)
- Bibliographic Notes (pp. 84–94)
- References and Source Materials (pp. 97–101)
Science

- Introduction, page 48
- Science in Preschool, page 49
- Development of the Whole Child, pages 49–50
- The Preschool Foundations for Science, pages 50–51

Science

- Individual, Cultural, and Linguistic Variations, pages 51–52
- Scientific Inquiry: The Skills and Language of Science, pages 52–53
- Communicating: The Role of Language in Scientific Inquiry, pages 53–55
Science

- Scientific Knowledge: The Content of Science in Preschool, pages 55–56
- Physical Sciences: Early Concepts in Physics, pages 56–57
- Life Sciences: Early Concepts in Biology, pages 57–58
- Earth Sciences: Early Concepts Related to Earth, pages 58–60

Science

- What key points did you take from your reading?
- What was some new or unfamiliar vocabulary that you came across?
- Which of the four strands particularly intrigued you?
Science

**Develop a poster:**
- Choose a strand of interest.
- Read the section of the Bibliographic Notes on the chosen strand.
- Include text and graphics to present highlights from some of the research articles.
- Connect the research findings to specific foundations in the strand.

Science: Learning Experience 6

http://www.wested.org/facultyinitiative/

Science

- Which elements from the posters stood out for you? Was there one poster that particularly caught your interest? Why?
- What was the easiest part of creating your poster? The most challenging part?
Science

- How did developing a poster help you understand the research and rationale for the strand you selected?
- What other questions came up for you as you reviewed the Bibliographic Notes and prepared your poster?

Science

- Which facts from the research highlights on the posters do you remember?
- Which facts were familiar? Which ones were new or caused you to have a different perspective?
Science

• What specific information helped you better understand one or more of the preschool science foundations?
• After viewing all the posters for the different strands, which strand other than the one you already selected would you choose to explore further? What is a first step you will take in that exploration?

Science

• Choose one strand.
• Select 3 relevant journal articles from References and Source Materials (pages 97–101).
• Write a short paper that includes summaries of each reference.
Science

For each article, include:
- Title and authors
- Publication information
- Brief summary
- Key findings that relate to one or more of the foundations in the strand
- How the article supports your understanding of the foundations in the strand
Science: Exploring the Influence of Family and Culture on the Science Foundations

Focus Statement

Students identify and consider a variety of family and cultural beliefs, values, practices, and circumstances that relate to children’s learning in the science domain and examine the foundations and examples through those perspectives.

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 Growth and Development
- Child, Family and Community
- Principle and Practices of Teaching Young Children
- Teaching in a Diverse Society
- Practicum-Field Experience

Instructional Methodologies

- Brainstorming
- Class discussion
- Class presentation
- Pairs or small groups
- 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.

- Child Development and Learning
- Culture, Diversity, and Equity
- Family and Community Engagement
- Learning Environments and Curriculum
- Professionalism
Science:
Exploring the Influence of Family and Culture on the Science Foundations

Before You Start

Children vary in their cultural backgrounds. As much as the development of scientific concepts is universal and salient in all cultures, cultural background may shape the development of some scientific concepts. Research indicates that the language to which children are exposed and culturally shared belief systems may play a role in children’s development of core biological concepts and reasoning (Anggoro, Waxman, and Medin 2005; Waxman and Medin 2006; Hatano and others 1993) (California Preschool Learning Foundations, Volume 3, pp. 51–52).

Children in California are remarkably diverse in their individual qualities such as temperament and personality as well as in their family and cultural backgrounds. Teachers need to be aware of, sensitive to, and respectful of this diversity that is seen in families’ home languages, values, cultural beliefs and traditions, and everyday practices.

In this learning experience, students will review the foundations and consider different family, community, and cultural factors that may impact children’s acquisition of some of the competencies described in the foundations. Some of these factors may bring up uncomfortable or sensitive memories or issues for some students, so it is important that information be presented in as objective a manner as possible. It may be helpful to preface this discussion with the reminder that increased understanding of families’ different belief systems and practices will help students be better prepared to partner with families in supporting children’s development in the science foundations.

It is suggested that students also review some of the examples for the foundations. If instructors have access to several copies of the California Preschool Learning Foundations, Volume 3, students could use them for this review. The publication is also available online at http://www.cde.ca.gov/sp/cd/re/psfoundations.asp#psfoundvol3. Students with electronic devices such as laptops or tablets may be able to view the downloaded publication during class.

Information Delivery

Students will be asked to identify different examples of diversity that characterize California’s children and families. The section on pages 3–5 of the California Preschool Curriculum Framework,
Volume 1 describes some of these characteristics and may be used as background reading or part of a lecture.

Examples from the California Preschool Learning Foundations, Volume 3 are also referred to in the discussions of cultural beliefs and science. The last paragraph in the right-hand column on page 51 through the top of the right-hand column on page 52 discusses possible roles that culture and language may have in children’s acquisition of science concepts. Additional studies that illustrate cultural influences on certain science concepts are found in the last paragraph in the left-hand column on page 90 through the top of the right-hand column on page 91.

**Getting it started**

Begin by asking students to think about the many kinds of diversity that children and families bring to California’s preschool programs. Instructors may want to give students time to review pages 3–5 in the California Preschool Curriculum Framework, Volume 1 for some examples. Chart all the students’ ideas and, as a group, identify the ones that students believe have an impact on children’s development of science skills and knowledge. For example, a family’s socioeconomic status could impact where a child lives and the opportunities for the child to play and explore outdoors, especially if the family lives in a very urban community. The child may not have had as much firsthand experience with the effects of weather and seasonal changes on plants. An example of the influence of culture and language on children’s beliefs about the concept of life is described on page 90 of the California Preschool Learning Foundations, Volume 3.

**Keeping it going**

Next ask students to find a partner or form a small group with two or three other students. Each group is to review a certain number of the preschool science foundations and examples and discuss ways that each of the considerations listed on the chart might impact the child’s development of the skill or knowledge described in each foundation. Suggest that the group come
Putting it together
Provide time for each group to share its work and invite the other students to ask questions and add other ways children’s family and cultural backgrounds might influence children’s demonstration of certain competencies.

Online Options
If the class has online-discussion capability, students could discuss other students’ summaries. If this approach were used, it would be important for the instructor to clearly identify each summary with some kind of agreed upon system so that students can readily comment on the appropriate one.

Taking it further
After all the groups have presented their ideas, ask the class to think about this statement from pages 51–52 of the California Preschool Learning Foundations, Volume 3:

> Children vary in their cultural backgrounds. As much as the development of scientific concepts is universal and salient in all cultures, cultural background may shape the development of some scientific concepts. Research indicates that the language to which children are exposed and culturally shared belief systems may play a role in children’s development of core biological concepts and reasoning (Anggoro, Waxman, and Medin 2005; Waxman and Medin 2006; Hatano and others 1993).

Ask students to discuss how they would approach different cultural beliefs in their work with young children and the science foundations. For example, if a child consistently “... attribute[d] to inanimate entities (e.g., a rock) attributes that are unique to living things” (California Preschool Learning Foundations, Volume 3, page 90), how might you determine the child’s understanding of the foundation in the Physical Sciences strand, “Properties and Characteristics of Nonliving Objects,” and the foundation in the Life Sciences strand, “Properties and Characteristics of Living Things”?

Another approach/way
Instead of assigning a certain number of foundations to each group of students, instructors could assign one or two of the family and cultural considerations identified by the class to each group. Each group then reviews all the foundations with the lens of the considerations it was assigned.
Online Options

If the class has document-sharing capability, each group could post its summary of the foundations it feels might be impacted by the specific family or cultural considerations assigned.

Reflection

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

• Which consideration on the list stands out the most for you? Why?
• Which considerations and examples were familiar to you? Which were new or caused you to have a different perspective?
• Which preschool science foundations do you think would be most impacted by a child’s family, community, linguistic, and cultural background and experiences? Why?
• How would you learn about some of the cultural beliefs of children in your classroom that might relate to the science foundations?
Children in California

Preschool children in California include those who:

- Are culturally diverse
- May speak a language other than English
- Have different abilities
- Come from diverse socioeconomic backgrounds
Children in California

California's children are racially and ethnically diverse.

- Refers to all children ages birth to 18 years

Children in California

Nearly half of all California’s children are growing up in a poor or low income household, where a family of 4 earns less than $45,622 annually.

- Refers to all children ages birth to 18 years
Science

- Almost half of all children living in California live in immigrant families.
- 22% of students in California are English learners.
- The majority of students who are English learners are native Spanish speakers.

~ Refers to all children ages birth to 18 years

Science

“Science is for all students, regardless of age, sex, cultural ethnic background, disabilities, aspirations, or interest and motivation in science.”

(National Committee on Science Education Standards and Assessment and National Research Council 1996, 20)
Science

- Children approach scientific inquiry and explanation having various linguistic, social, and cognitive skills.
- Cultural background may shape the development of some scientific concepts.
- Experiences with the natural world affect children’s understanding of science concepts.

Science

- Many children in California are learning about scientific concepts and skills while acquiring English.
- Some children may communicate their science knowledge and skills using nonverbal means of communication.
Science

- How might children’s family and cultural backgrounds impact their development of the skill or knowledge described in each science foundation?

Science

While the development of scientific concepts is universal and salient in all cultures, cultural background may shape the development of some scientific concepts.
Science

The language to which children are exposed and culturally shared belief systems may play a role in children’s development of core biological concepts and reasoning.

(Anggoro, Waxman, and Medin 2005; Waxman and Medin 2006; Hatano and others 1993)

Science

- How would you approach different cultural beliefs in your work with young children and the science foundations?
Science

- Which consideration stands out the most for you? Why?
- Which considerations and examples were familiar to you? Which were new or caused you to have a different perspective?

Science

- Which preschool science foundations do you think would be most impacted by a child’s family, community, linguistic, and cultural background and experiences? Why?
- How would you learn about some of the cultural beliefs of children in your classroom that might relate to the science foundations?
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
Science: Identifying Family and Cultural Connections to the Science Foundations

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.
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.

<table>
<thead>
<tr>
<th>Strand</th>
<th>Substrand</th>
<th>Foundation</th>
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<tbody>
<tr>
<td>Scientific Inquiry</td>
<td>1.0 Observation and Investigation</td>
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<td>1.6</td>
</tr>
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<td></td>
<td>2.0 Documentation and Communication</td>
<td>2.1</td>
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<td></td>
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<td>2.2</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>1.0 Properties and Characteristics of Nonliving Objects and Materials</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>2.0 Changes in Nonliving Objects and Materials</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>1.0 Properties and Characteristics of Living Things</td>
<td>1.1</td>
</tr>
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<td>1.4</td>
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<tr>
<td></td>
<td>2.0 Changes in Living Things</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>1.0 Properties and Characteristics of Earth Materials and Objects</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>2.0 Changes in the Earth</td>
<td>2.1</td>
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<tr>
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<td>2.2</td>
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<td></td>
<td></td>
<td>2.3</td>
</tr>
</tbody>
</table>
### Strand | Substrand | Foundation
--- | --- | ---
Earth Sciences | 2.0 Changes in the Earth (continued) | 2.4

**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.

**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

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**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.
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.

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.

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.

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

- 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?

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

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?

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.
Science

**Scientific Inquiry**
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

**Physical Sciences**
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

Science

Family and Cultural Connections
- Identify examples in the foundations that could be observed in children’s homes or community settings.
- Develop additional examples of children demonstrating the knowledge and skills addressed by the foundations in their homes and communities.
- Consider different home settings, communities, cultural beliefs and practices, languages, and seasons.
Science

Family and Cultural Connections

- Prepare an article or presentation for families that describes science in preschool, explains the foundation(s), and includes examples of how parents might see their children demonstrating the foundation(s) at home or in their community.
- Include a photo or drawing.

Science

- What words, ideas, examples, or design features stood out?
- Which examples seemed familiar to you? Which ones were very different from your prior experiences with children and families?
Science

- How did creating examples and/or an article or presentation increase your awareness and understanding of the diversity of family, community, and cultural backgrounds and experiences that children have related to the science foundations?

Science

- What considerations will you keep in mind when applying the science foundations to your work with children and families?
Science

Questions for Parents:
• What information stands out to you?
• What do you like about the article?
• What parts are not clear?
• What did you learn about science and children?

Questions for Parents:
• 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?
Science: Exploring Examples of the Science Domain in the Early Care and Education Setting

Focus Statement

Students explore the examples of foundations in the science domain and then engage in classroom observations to look for additional examples of the foundations in action. This learning experience is designed to help students understand that the examples in the foundations are not criteria and that children will demonstrate the foundations in many settings and ways.

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
- Observation and Assessment
- Practicum-Field Experience

Instructional Methodologies

- Brainstorming
- Class discussion
- Development of resource tool
- Observations
- 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.

- Child Development and Learning
- Observation, Screening, Assessment, and Documentation
- Learning Environments and Curriculum
- Professionalism
Before You Start

In this learning experience, students are asked to observe children in group settings and watch for examples of children’s behavior that demonstrate foundations in the science domain. Because the content of this domain might be less familiar than other domains to students, it will be important to familiarize them with the strands and substrands of this domain and with some of the examples for each foundation before they are asked to observe in early care and education settings. One way to do this is to have students do Learning Experience 3 in this domain titled “Piecing Together the Science Domain Content Puzzle.”

The first strand of the science domain is Scientific Inquiry, and it is highlighted in this learning experience so that all students have exposure to its content. This is done so that all students can become familiar with the underlying process that supports inquiry in the other science domains.

Building example banks is a feature of every domain in each of the instructional guides for the three volumes of the *California Preschool Learning Foundations*. This has been done to emphasize in each domain that the examples presented for each foundation are neither assessment to be used as a checklist nor curriculum suggestions. It is also designed to expand students’ observation skills and to help students understand that what they see in early care and education settings are the foundations in action.

Two handouts are provided with this learning experience. Handout 1 is a list of the foundations for the science domain, and Handout 2 is an observation guide, which students can use when they do their classroom observations. Electronic versions of these handouts will be available when this instructional guide is online at www.wested.org/facultyinitiative.

Students also will review the examples provided for the foundations. If instructors have access to several copies of the *California Preschool Learning Foundations, Volume 3*, students could use them for this review. The publication is also available online at http://www.cde.ca.gov/sp/cd/re/psfoundations.asp#psfoundvol3. Students with electronic devices such as laptops or tablets may be able to view the downloaded publication during class.

**Information Delivery**

Direct students’ attention to the first column of the text on page xiv in the Introduction to the *California Preschool Learning*...
Foundations, Volume 3. This text addresses the use of examples in the foundations and emphasizes that the examples are not to be used as assessment or curriculum but as ways in which children might demonstrate the attainment of a foundation. This text also stresses that children might demonstrate behaviors that show the foundations in action in a variety of early care and education contexts, such as “engaging in imaginative play, exploring the environment and materials, making discoveries, being inventive, or interacting with peers, teachers, or other adults (California Preschool Learning Foundations, Volume 3, p. xiv).”

Many of the foundations will be demonstrated through the use of language, and students should be prepared to observe children expressing themselves in any language or nonverbally.

After discussing how examples are used in the foundations, review the strands and substrands in this domain in class before students do their observations. This can be done by asking students to read the foundations aloud in turn. A summary list of the foundations can be found in the science domain in Appendix B of the California Preschool Learning Foundations, Volume 3 on pages 108–112 and as a handout for this learning experience.

Reviewing a few of the examples for each foundation as you go through them will also be helpful for many students. It will be important here to remind students again that examples are neither assessment nor curriculum suggestions. As you do this, you might ask students which of the early care and education contexts (from page xiv of the Introduction to the California Preschool Learning Foundations, Volume 3) an example represents. It is likely that many examples will represent more than one context.

Another way to familiarize students with this domain is to have them do Learning Experience 3 mentioned in the “Before You Start” section, “Piecing Together the Science Domain Content Puzzle.”

Active Learning

Getting it started
Organize students into pairs or groups of three. Assign each group or pair to the Scientific Inquiry strand and one other strand. It is important for each pair or group to work with the Scientific Inquiry strand because it is the fundamental process that is applied to and used in the other three strands. In addition, the substrands are different in the Scientific Inquiry strand from the substrands that are consistent in the other strands. Because of these variations, it is important for students to become familiar with the differing structures of the strands.
As students begin their work in pairs or groups, ask them first to concentrate on the foundations in the Scientific Inquiry strand. Ask them to read through the examples for this strand and discover examples that they have seen or heard young children demonstrate.

Next, again having them work in their pairs or groups, ask them to think of other ways they have observed, heard of, or can think of children possibly demonstrating each foundation in this strand. They can write down notes or examples on the summary handout or on other sheets of paper.

Guide them through this same process for their additional strand.

**Keeping it going**

Building an example bank can then be done to extend and further support students’ understanding of the foundations in this domain and that the examples are neither assessment nor curriculum.

Ask students to observe children in a preschool classroom. This could be where they are currently working or where they might have approved access to do an observation. If the observation can be done in pairs, it will increase the learning as each pair reviews and discusses its observations. Assign specific strands to individual students or pairs to focus their observations. Assigning the Scientific Inquiry strand with one other strand, as done in the “Getting it started” section, would be helpful for students to increase their familiarity with the Scientific Inquiry strand. Be sure students still have Handout 1, the summary of the science domain foundations, and Handout 2, the “Observation Guide” for this learning experience.

Remind the students that, when they look for examples, they are looking for observable behaviors or actions that demonstrate the foundations in action. The point of this exercise is not to assess children’s development but rather to explore the foundations and see where and how children demonstrate aspects of these foundations in their daily activities. Students might be unsure if something is an example or they might be reluctant to label the development that they are observing, but suggest that they just document what they see as examples of the foundations and bring their observations back to class for discussion. It is in the discussion that greater understanding and clarity will emerge.
Putting it together
Ask students to bring their list of examples to class. Give students chart paper or whiteboard space so that they can display the examples they observed. Each student can write the examples out on strips of paper or list the examples on chart paper so that the entire class can see them. Be sure the examples are arranged by the strands or substrands that were observed.

Give students time to walk about and see what has emerged. Remind students that it is unlikely that they will see all the science foundations in a single observation. Children will demonstrate behaviors related to the foundations over many activities and over repeated experiences over time.

Be sure that the examples are collected and made available as a resource to students. This can be their example bank.

Then ask students to reflect on their observations, using the following questions:

- Is there anything you particularly noticed about all the examples?
- Were there some contexts or routines in the classroom where it was easy to see certain foundations in action? Which ones?
- Did some foundations appear in some routines or contexts and not others? Which were they and when did they appear?
- Were there some contexts or routines in the classroom where it was difficult to see science foundations in action?
- What does this tell you about the importance of ongoing observation in early care and education settings?
- What are the implications of this for your current or future work with young children?

Reflection

Online Options
Students could post their observations online for review by their classmates. If the class has online-discussion capability, the questions could be explored through an instructor led discussion online.
# Science

## Scientific Inquiry

### 1.0 Observation and Investigation

<table>
<thead>
<tr>
<th></th>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
<td>Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td>1.2</td>
<td>Observe objects and events in the environment and describe them.</td>
<td>Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td>1.3</td>
<td>Begin to identify and use, with adult support, some observation and measurement tools.</td>
<td>Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td>1.4</td>
<td>Compare and contrast objects and events and begin to describe similarities and differences.</td>
<td>Compare and contrast objects and events and describe similarities and differences in greater detail.</td>
</tr>
<tr>
<td>1.5</td>
<td>Make predictions and check them, with adult support, through concrete experiences.</td>
<td>Demonstrate an increased ability to make predictions and check them (e.g., may make more complex predictions, offer ways to test predictions, and discuss why predictions were correct or incorrect).</td>
</tr>
<tr>
<td>1.6</td>
<td>Make inferences and form generalizations based on evidence.</td>
<td>Demonstrate an increased ability to make inferences and form generalizations based on evidence.</td>
</tr>
</tbody>
</table>

1. Other related scientific processes, such as classifying, ordering, and measuring, are addressed in the foundations for mathematics.

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2.0 Documentation and Communication

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Record observations or findings in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos.</td>
<td>2.1 Record information more regularly and in greater detail in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, photos, or by tallying and graphing information.</td>
</tr>
<tr>
<td>2.2 Share findings and explanations, which may be correct or incorrect, with or without adult prompting.</td>
<td>2.2 Share findings and explanations, which may be correct or incorrect, more spontaneously and with greater detail.</td>
</tr>
</tbody>
</table>

Physical Sciences

1.0 Properties and Characteristics of Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Observe, investigate, and identify the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
<td>1.1 Demonstrate increased ability to observe, investigate, and describe in greater detail the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
</tr>
</tbody>
</table>

2.0 Changes in Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Demonstrate awareness that objects and materials can change; explore and describe changes in objects and materials (rearrangement of parts; change in color, shape, texture, temperature).</td>
<td>2.1 Demonstrate an increased awareness that objects and materials can change in various ways. Explore and describe in greater detail changes in objects and materials (rearrangement of parts; change in color, shape, texture, form, and temperature).</td>
</tr>
</tbody>
</table>
2.0 Changes in Nonliving Objects and Materials (continued)

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Observe and describe the motion of objects (in terms of speed, direction, the ways things move), and explore the effect of own actions (e.g., pushing, pulling, rolling, dropping) on making objects move.</td>
<td>2.2 Demonstrate an increased ability to observe and describe in greater detail the motion of objects (in terms of speed, direction, the ways things move), and to explore the effect of own actions on the motion of objects, including changes in speed and direction.</td>
</tr>
</tbody>
</table>

Life Sciences

1.0 Properties and Characteristics of Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
<td>1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>1.2 Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
<td>1.2 Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
</tr>
<tr>
<td>1.3 Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.</td>
<td>1.3 Recognize that living things have habitats in different environments suited to their unique needs.</td>
</tr>
<tr>
<td>1.4 Indicate knowledge of the difference between animate objects (animals, people) and inanimate objects. For example, expect animate objects to initiate movement and to have different insides than inanimate objects.</td>
<td>1.4 Indicate knowledge of the difference between animate and inanimate objects, providing greater detail, and recognize that only animals and plants undergo biological processes such as growth, illness, healing, and dying.</td>
</tr>
</tbody>
</table>

2. The knowledge of body parts is also addressed in the California Preschool Foundations (Volume 2) for health. In science, it also includes the knowledge of body processes. Knowledge of body parts is extended to those of humans and other animals.

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### 2.0 Changes in Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1</strong> Observe and explore growth and changes in humans, animals, and plants and demonstrate an understanding that living things change over time in size and in other capacities as they grow.</td>
<td><strong>2.1</strong> Observe and explore growth in humans, animals, and plants and demonstrate an increased understanding that living things change as they grow and go through transformations related to the life cycle (for example, from a caterpillar to butterfly).</td>
</tr>
<tr>
<td><strong>2.2</strong> Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.</td>
<td><strong>2.2</strong> Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).</td>
</tr>
</tbody>
</table>

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Earth Sciences

1.0 Properties and Characteristics of Earth Materials and Objects

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
<td>1.1 Demonstrate increased ability to investigate and compare characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
</tr>
</tbody>
</table>

2.0 Changes in the Earth

| 2.1 Observe and describe natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change. | 2.1 Demonstrate an increased ability to observe and describe natural objects in the sky and to notice patterns of movement and apparent changes in the sun and the moon. |
| 2.2 Notice and describe changes in weather. | 2.2 Demonstrate an increased ability to observe, describe, and discuss changes in weather. |
| 2.3 Begin to notice the effects of weather and seasonal changes on their own lives and on plants and animals. | 2.3 Demonstrate an increased ability to notice and describe the effects of weather and seasonal changes on their own lives and on plants and animals. |
| 2.4 Develop awareness of the importance of caring for and respecting the environment and participate in activities related to its care. | 2.4 Demonstrate an increased awareness and the ability to discuss in simple terms how to care for the environment, and participate in activities related to its care. |
### Observation Guide:
Exploring Examples of the Science Domain

<table>
<thead>
<tr>
<th>Strand: Scientific Inquiry</th>
<th>Substrand: Observation and Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Setting:</td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strand: Scientific Inquiry</th>
<th>Substrand: Documentation and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Setting:</td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strand: Physical Sciences</th>
<th>Substrand: Properties and Characteristics of Nonliving Objects and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Setting:</td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
</tr>
</tbody>
</table>
## Observation Guide:
Exploring Examples of the Science Domain (Continued)

<table>
<thead>
<tr>
<th>Setting:</th>
<th>Examples:</th>
</tr>
</thead>
</table>
| **Strand: Physical Sciences**  
Substrand: Changes in Nonliving Objects and Materials | |
| Setting: | Examples: |
| **Strand: Life Sciences**  
Substrand: Properties and Characteristics Living Things | |
| Setting: | Examples: |
| **Strand: Life Sciences**  
Substrand: Changes in Living Things | |
Observation Guide:
Exploring Examples of the Science Domain (Continued)

<table>
<thead>
<tr>
<th>Strand: Earth Sciences</th>
<th>Substrand: Properties and Characteristics of Earth Materials and Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting:</td>
<td>Examples:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strand: Earth Sciences</th>
<th>Substrand: Changes in the Earth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting:</td>
<td>Examples:</td>
</tr>
</tbody>
</table>
Science

**Examples listed in the foundations:**

- Suggest possible ways children may demonstrate the competencies addressed in the foundations.
- Illustrate contexts in which children may show the competencies described in the foundations.
Science

**Examples listed in the foundations:**

- Show that children learn while engaging in imaginative play, exploring the environment and materials, making discoveries, being inventive, or interacting with peers, teachers, or other adults.
- Illustrate possible behaviors and are not exhaustive of the many ways children may demonstrate the competencies.

**Science**

**Scientific Inquiry**

(skills and language related to science)

1.0 Observation and Investigation
2.0 Documentation and Communication

**Physical Sciences**

1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

Science

Scientific Inquiry

1.0 Observation and Investigation

<table>
<thead>
<tr>
<th>At around 45 months of age</th>
<th>At around 90 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
<td>1.1 Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td>1.2 Observe objects and events in the environment and describe them.</td>
<td>1.2 Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td>1.3 Begin to identify and use, with adult support, some observation and measurement tools.</td>
<td>1.3 Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td>1.4 Compare and contrast objects and events and begin to describe similarities and differences.</td>
<td>1.4 Compare and contrast objects and events and describe similarities and differences in greater detail.</td>
</tr>
</tbody>
</table>
Is there anything you particularly noticed about all the examples?

Were there some contexts or routines in the classroom where it was easy to see certain foundations in action? Which ones?
Science

• Did some foundations appear in some routines or contexts and not others? Which were they and when did they appear?

• Were there some contexts or routines in the classroom where it was difficult to see science foundations in action?

Science

• What does this tell you about the importance of ongoing observation in early care and education settings?

• What are the implications of this for your current or future work with young children?
Science: Exploring the Use of Picture Books to Support the Science Foundations in Early Care and Education Settings

Focus Statement

Students will become familiar with the content of the science foundations by identifying picture books that relate to the four strands.

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
- Practicum-Field Experience

Instructional Methodologies

- Creation of a visual representation
- Development of resource tool
- Guided experience in the community (i.e., visit to local library)
- Pairs or 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.

- Child Development and Learning
- Family and Community Engagement
- Learning Environments and Curriculum
- Professionalism
Science:
Exploring the Use of Picture Books to Support the Science Foundations in Early Care and Education Settings

Before You Start

This learning experience provides an opportunity for students to find and explore picture books for young children that are related to the science foundations. They will be searching for books that are related to the foundations, which also will provide children with age-appropriate information in a literacy-based format that they can understand and enjoy. This is especially important because there are many commercial books available that might appear appropriate to this topic but that involve situations that are neither accurate nor based on evidence. Though fantasy and imaginative scenarios are important when appropriately included in children’s literature, the use of books to support children’s understanding of the science foundations should present science-based information. Several trustworthy sources of such books are the following organizations:

- American Library Association
  [http://www.ala.org/offices/publishing/booklist/booklinks/resources/readaloudscience](http://www.ala.org/offices/publishing/booklist/booklinks/resources/readaloudscience)

- Children and Nature Network
  [http://www.childrenandnature.org/resources/center/](http://www.childrenandnature.org/resources/center/)

- KinderNature

- National Science Teachers Association

- U.S. Department of Education, Office of Communications and Outreach, Helping Your Child Learn Science

This learning experience also will provide opportunities for students to become acquainted with local libraries and children’s librarians, who can be valuable resources in students’ work with young children. Students might also have to get library cards, and if this is problematic for any students, make sure that each pair has one person with a library card or the ability to get one.

The amount of time instructors allow for students to find their books, develop their posters, and bring them to class will depend on where this will fit into the course work. It
could be one week, two weeks, or whatever would fit into the flow of the design of the course. Posters could also be developed in class, which would mean that instructors might provide the posters and materials for their development, such as markers, collage materials, glue sticks, and scissors.

**Information Delivery**

Before beginning, review the science foundations with students. Be sure they are very familiar with the strands and substrands.

Ask them to read the Introduction to the science domain of the *California Preschool Learning Foundations, Volume 3*. Emphasize the importance of understanding the knowledge base and concepts for Physical Sciences, Life Sciences, and Earth Sciences and the rationale for the Scientific Inquiry strand. They will need to be familiar with these in order to find picture books relating to this knowledge and these concepts.

**Active Learning**

**Getting it started**

Let students know that they will be visiting a library to locate picture books that address the science foundations. Remind them that they can request help from a children’s librarian at a local library. As an alternative, many university and community college libraries have collections of children’s picture books and would be a good resource as well. Many libraries will have their own lists of picture books related to different topics, including the topics of the science domain, and librarians will either know of those lists or know of relevant books. Sharing a copy of the *California Preschool Learning Foundations, Volume 3* can provide helpful information to the librarian. It is important that students find books that address the strands and substrands and that will help children understand these concepts at a level that is age appropriate.

**Keeping it going**

Group students into pairs and let them know that they will be bringing books to class and designing and presenting a poster display for their books. Instructors can distribute the strands to each pair in any way that will work for the numbers of students in the class. Instructors could assign students to specific strands, but they will not find equal numbers of books for each strand. For example, Life Sciences would provide many more books than Earth Sciences. An alternative would be to ask each pair to find four books, with each representing one of the strands.

Explain to students that they will develop their poster either out of class or as part of a class session, whichever method the instructor
selects. Each poster should highlight, in some way, the books that each pair has found and brought to class.

**Putting it together**
When students have had time to find their books and develop their posters, organize a poster gallery and gallery walk, followed by a class discussion. Ask students to review the books and posters and consider the following questions:

- Which foundations did they see represented? Remind students that they might not see them exactly as they are stated in the foundations but to think about experiences that might be examples of the knowledge base, concepts, or behaviors relative to the substrands or foundations.
- Did the books give them some ideas for science activities they can do in an early care and education setting? What were these?
- How could children who are dual language learners be included as you are reading these picture books to a group?

Instructors could ask students to record their responses to these questions as they walk the gallery, or wait until the discussion that follows their gallery walk. In any case, be alert to other questions that might have come up during their walk.

**Online Options**
Students could post photographs of their posters with a list of the books online. If the class has online-discussion capability, the students could then discuss the questions after reviewing the posters.

**Taking it further**
Ask each pair to write a two- or three-sentence description of what happens in each of their books, and identify strands and substrands that are addressed in their books. These could be collected, compiled, and given to students as a resource for their work with young children.

**Online Options**
Students could post their annotated lists of children's picture books online.

**Reflection**
Following the class discussion, ask students to reflect on their experience, using the following questions:

- What was surprising about looking for picture books related to the science domain?
• What did the posters suggest regarding the foundations that was a new idea?

• Which strand was most familiar? Which was least familiar? What does that suggest about your work with young children regarding the science foundations?

• What would you like to continue to learn about regarding using picture books to support children’s experiences with the science foundations?

• How could you continue to learn more about that?
Science

Scientific Inquiry
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

Physical Sciences
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

Science

Using Picture Books to Support the Science Foundations

• Which foundations were represented?
• Did the books give you some ideas for science activities that you could do in an early care and education setting? What were these?
• How could children who are dual language learners be included as you are reading these picture books to a group?
Science

Using Picture Books to Support the Science Foundations

- Write a 2–3 sentence description of what happens in each book.
- Identify and list the strands and substrands that are addressed in each book.

Science

- What was surprising about looking for picture books related to the science domain?
- What did the posters suggest regarding the foundations that was a new idea?
Science

- Which strand was most familiar? Which was least familiar?

- What does that suggest about your work with young children regarding the science foundations?

Science

- What would you like to continue to learn about regarding using picture books to support children’s experiences with the science foundations?

- How could you continue to learn more about that?
Focus Statement

Students explore the relationships between the foundations of the science domain with those of the mathematics and language and literacy domains by identifying key vocabulary that supports children’s understanding of the concepts in each domain and how vocabulary from one domain also facilitates children’s learning in other domains.

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
- Practicum-Field Experience

Instructional Methodologies

- Brainstorming
- Class discussion
- Creation of a visual representation
- Jigsaw reading
- Pairs or small groups
- 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.

- Child Development and Learning
- Dual-Language Development
- Learning Environments and Curriculum
- Professionalism
Science:
Exploring the Relationship of the Science Domain
to the Mathematics Domain and the
Language and Literacy Domain

Before You Start

Volume 3 of the California Preschool Learning Foundations presents the final two
domains of early learning and development produced by the California Department of
Education as part of its early learning system. The foundations are the heart of this
system (California Preschool Learning Foundations, Volume 3, p. xvi), and this volume
provides a unique opportunity for students to become acquainted with all nine domains.
There are four learning experiences in this instructional guide that, when used as a set,
can provide opportunities for students to explore all nine domains and some of the ways
in which they relate to one another. These experiences are not exhaustive cross-linking
of all domains but provide opportunities for students to work with some selected
relationships that strongly represent the integrated nature of early development. Each of
these learning experiences focuses on one of the two domains in the California
Preschool Learning Foundations, Volume 3 and a selected domain or set of domains
from either the California Preschool Learning Foundations, Volume 1 or California

Depending on the emphasis of any particular course, any of these four learning
experiences can be used independently of the others or all four can be used in
sequence or combination. The following list of these four learning experiences
describes the domains addressed in each one:

• History–social science domain, Learning Experience 11—“Discovering
  Relationships Between the History–Social Science Domain and the Social-Emotional
  Development Domain and the English-language Development Domain”—focuses on
  the relationship of the history–social science domain in Volume 3 to the domains of
  social-emotional development and English-language development in Volume 1.

• History–social science domain, Learning Experience 12—“Discovering Relationships
  of the History–Social Science Domain to the Visual and Performing Arts Domain”—
  focuses on the relationship of the history–social science domain to the visual and
  performing arts domain in Volume 2.

• Science domain, Learning Experience 11—“Exploring the Relationship off the
  Science Domain to the Mathematics Domain and the Language and Literacy
  Domain”—focuses on the relation of the science domain in Volume 3 to the
mathematics and language and literacy domains in Volume 1.

- Science domain, Learning Experience 12—“Exploring Relationships of the Science Domain to the Physical Development Domain and the Health Domain”—focuses on the relationship of the science domain to the domains of physical development and health in Volume 2.

Thus each of the nine domains is explored in relation to at least one other domain, and the domains in Volume 3 are highlighted. The specific domains explored in relation to one another are grouped in a way that highlights strong relationships between the strands of these domains. This is intended to support an understanding by students of how these various domains in the foundations are integrated in early learning and development.

Each of the four learning experiences guides students through domains using different instructional methodologies. These methodologies could be used as presented or used flexibly across several sets of domains. For example, the charting experience described in the history–social science Learning Experience 11 could be used for any number or combination of strands across any number of domains.

This learning experience will first focus on the relationship of the vocabulary of the mathematics domain to the vocabulary of three of the science strands: Physical Sciences, Life Sciences, and Earth Sciences. Then students will focus on the relation of the language and literacy domain to one of the Scientific Inquiry strands. It will be very important to point out to students that the relationships are not limited to the way in which they are explored here. All mathematics strands and all language and literacy strands are strongly related to all science strands but have been divided here only for purposes of guided exploration.

Handouts of the foundations for the science (Handout 1), mathematics (Handout 2), and language and literacy (Handout 3) domains are provided with this learning experience. Handout 4, “Key Vocabulary in Science and Mathematics,” is also included with this learning experience. Electronic versions of these handouts will be available when this instructional guide is online at www.wested.org/facultyinitiative.

Information Delivery

Make sure that students have read through the Introduction to the science domain before beginning this experience (California Preschool Learning Foundations, Volume 3, pp 48–60). For this learning experience, the section relating to language and science (California Preschool Learning Foundations, Volume 3, pp 52–55) is especially important.
Getting it started
Organize students into pairs or groups of three. Make sure each group has a copy of the summary of the science foundations, which can be found in the publication (pp 108–112) or as Handout 1 with this learning experience.

Part 1.
Students will be working initially only with the strands of Physical Sciences, Life Sciences, and Earth Sciences. Each pair or group can work with all three of these strands, or instructors could assign one strand to each pair or group. Ask each pair or group of three to use the summary to develop a list of key vocabulary. These would be words that young children would need to know in order to describe, ask questions, respond to questions, predict, or record observations about things and events that are the content of each of these strands. For example, in the Physical Sciences strand, children would need to know words describing size (big, little), shape (round, square), weight (light, heavy), and sound (loud, quiet). These lists do not need to be exhaustive; the main point is to develop enough key vocabulary to be able to see that there is a strong relationship between the vocabulary of science and the vocabulary of mathematics, which is the next part of this experience.

Keeping it going
When students have developed their lists, ask them to turn to the summary of the mathematics domain, either on pages 189–192 of the *California Preschool Learning Foundations, Volume 1* or the summary provided as Handout 2 with this learning experience.

Ask students to look through the mathematics strands. Give them some time to do this, so that they can develop some familiarity with the concepts and vocabulary. Again, each pair or group of three can look through all the strands or you can assign individual strands to individual pairs of groups.

Direct them to Handout 4 that accompanies this learning experience. Ask them to begin by placing in the box for each science strand the key vocabulary you find in the foundations for that strand. Ask them to then look across the mathematics strands and find similar vocabulary or concepts that relate to the science vocabulary.
Then ask them to discuss, in their small groups, how knowing key vocabulary relating to these three science strands will support and strengthen children’s development and learning in the mathematics strands. And how will mathematics vocabulary support learning and development in the science strands? These two questions are listed on Handout 4.

When they have had time to work across the two domains, reconvene as a whole group and discuss what they found as they worked through the vocabularies. They can share key points from their small group discussions of the two questions.

Then ask students to consider these questions:

- Where did you find similarities in the vocabulary of these two domains?
- What is a difference in how these similar key vocabularies are used in these two domains? Note to instructors—One difference might be that in the mathematics domain the vocabulary defines the concepts being learned, whereas in the science domain, the vocabulary enables ongoing exploration of areas of knowledge and understanding.

Part 2.
Now ask students to go through a similar process using the science strand entitled Scientific Inquiry and the language and literacy domain.

First, ask them to develop a list of key skills in the Scientific Inquiry strand. Instructors might want to do this as a whole group, since the skills might not be as easily identified as vocabulary was identified in the other strands. A list of skills might end up looking like the foundations themselves, such as comparing and contrasting, describing, predicting, using measurement tools, recording observations, and sharing findings and explanations.
Then ask students to work in small groups and look through the strands and substrands of the language and literacy domain in Volume 1 of the *California Preschool Learning Foundations*. There are three strands and nine substrands, and instructors might want to divide these up for small group work.

The following question is suggested to guide the students’ work: How would demonstrating the foundations (the knowledge and skills) in the language and literacy domain support the development of the skills found in the foundations in the Scientific Inquiry strand in the science domain?

**Putting it together**

Give students some time to work on developing their list of skills and thinking about the question and then ask them to share their explorations. They will probably find that the ability to engage in scientific inquiry is heavily dependent on language and literacy skills. Remind students that children can demonstrate the language and literacy skills with any language and in nonverbal ways. The use of alternate modes of communication should not limit any child’s opportunities to engage in scientific inquiry or develop understanding in any of the strands of the science domain.

**Reflection**

When students have finished their explorations and have a chance to discuss them as a whole class, ask them to reflect on their experience with the following questions:

- What discoveries did you make while you were doing this?
- Did some strands or domains have stronger relationships than others?
- What new ideas about early learning and development emerged?
- What more do you want to find out about regarding the domains you worked with? How could you get that information?

**Taking it further**

One way to further engage students with this material would be to ask students to develop a visual display of related vocabulary (and therefore related concepts) in the mathematics strands and three strands being explored in the science domain. This could be done as posters or as electronic displays using PowerPoint or an interactive whiteboard. Have students present their displays to the rest of the group, either individually or in a gallery context.
# Science

## Scientific Inquiry

### 1.0 Observation and Investigation

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
<td>1.1 Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td>1.2 Observe objects and events in the environment and describe them.</td>
<td>1.2 Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td>1.3 Begin to identify and use, with adult support, some observation and measurement tools.</td>
<td>1.3 Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td>1.4 Compare and contrast objects and events and begin to describe similarities and differences.</td>
<td>1.4 Compare and contrast objects and events and describe similarities and differences in greater detail.</td>
</tr>
<tr>
<td>1.5 Make predictions and check them, with adult support, through concrete experiences.</td>
<td>1.5 Demonstrate an increased ability to make predictions and check them (e.g., may make more complex predictions, offer ways to test predictions, and discuss why predictions were correct or incorrect).</td>
</tr>
<tr>
<td>1.6 Make inferences and form generalizations based on evidence.</td>
<td>1.6 Demonstrate an increased ability to make inferences and form generalizations based on evidence.</td>
</tr>
</tbody>
</table>

1. Other related scientific processes, such as classifying, ordering, and measuring, are addressed in the foundations for mathematics.

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## 2.0 Documentation and Communication

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1</strong> Record observations or findings in various ways, with adult assistance, including</td>
<td><strong>2.1</strong> Record information more regularly and in greater detail in various ways, with adult</td>
</tr>
<tr>
<td>pictures, words (dictated to adults), charts, journals, models, and photos.</td>
<td>assistance, including pictures, words (dictated to adults), charts, journals, models, photos,</td>
</tr>
<tr>
<td></td>
<td>or by tallying and graphing information.</td>
</tr>
<tr>
<td><strong>2.2</strong> Share findings and explanations, which may be correct or incorrect, with or without</td>
<td><strong>2.2</strong> Share findings and explanations, which may be correct or incorrect, more</td>
</tr>
<tr>
<td>adult prompting.</td>
<td>spontaneously and with greater detail.</td>
</tr>
</tbody>
</table>

## Physical Sciences

### 1.0 Properties and Characteristics of Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> Observe, investigate, and identify the characteristics and physical properties of</td>
<td><strong>1.1</strong> Demonstrate increased ability to observe, investigate, and describe in greater</td>
</tr>
<tr>
<td>objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
<td>detail the characteristics and physical properties of objects and of solid and nonsolid</td>
</tr>
<tr>
<td></td>
<td>materials (size, weight, shape, color, texture, and sound).</td>
</tr>
</tbody>
</table>

### 2.0 Changes in Nonliving Objects and Materials

| **2.1** Demonstrate awareness that objects and materials can change; explore and describe   | **2.1** Demonstrate an increased awareness that objects and materials can change in various   |
| changes in objects and materials (rearrangement of parts; change in color, shape, texture,  | ways. Explore and describe in greater detail changes in objects and materials (rearrangement  |
| temperature).                                                                              | of parts; change in color, shape, texture, form, and temperature).                           |

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### 2.0 Changes in Nonliving Objects and Materials (continued)

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Observe and describe the motion of objects (in terms of speed, direction, the ways things move), and explore the effect of own actions (e.g., pushing, pulling, rolling, dropping) on making objects move.</td>
<td>2.2 Demonstrate an increased ability to observe and describe in greater detail the motion of objects (in terms of speed, direction, the ways things move), and to explore the effect of own actions on the motion of objects, including changes in speed and direction.</td>
</tr>
</tbody>
</table>

### Life Sciences

### 1.0 Properties and Characteristics of Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
<td>1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>1.2 Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
<td>1.2 Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
</tr>
<tr>
<td>1.3 Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.</td>
<td>1.3 Recognize that living things have habitats in different environments suited to their unique needs.</td>
</tr>
<tr>
<td>1.4 Indicate knowledge of the difference between animate objects (animals, people) and inanimate objects. For example, expect animate objects to initiate movement and to have different insides than inanimate objects.</td>
<td>1.4 Indicate knowledge of the difference between animate and inanimate objects, providing greater detail, and recognize that only animals and plants undergo biological processes such as growth, illness, healing, and dying.</td>
</tr>
</tbody>
</table>

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2. The knowledge of body parts is also addressed in the California Preschool Foundations (Volume 2) for health. In science, it also includes the knowledge of body processes. Knowledge of body parts is extended to those of humans and other animals.

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### 2.0 Changes in Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Observe and explore growth and changes in humans, animals, and plants and demonstrate an understanding that living things change over time in size and in other capacities as they grow.</td>
<td>2.1 Observe and explore growth in humans, animals, and plants and demonstrate an increased understanding that living things change as they grow and go through transformations related to the life cycle (for example, from a caterpillar to butterfly).</td>
</tr>
<tr>
<td>2.2 Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.</td>
<td>2.2 Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).</td>
</tr>
</tbody>
</table>

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# Earth Sciences

## 1.0 Properties and Characteristics of Earth Materials and Objects

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
<td>1.1 Demonstrate increased ability to investigate and compare characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
</tr>
</tbody>
</table>

## 2.0 Changes in the Earth

| 2.1 Observe and describe natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change. | 2.1 Demonstrate an increased ability to observe and describe natural objects in the sky and to notice patterns of movement and apparent changes in the sun and the moon. |
| 2.2 Notice and describe changes in weather. | 2.2 Demonstrate an increased ability to observe, describe, and discuss changes in weather. |
| 2.3 Begin to notice the effects of weather and seasonal changes on their own lives and on plants and animals. | 2.3 Demonstrate an increased ability to notice and describe the effects of weather and seasonal changes on their own lives and on plants and animals. |
| 2.4 Develop awareness of the importance of caring for and respecting the environment and participate in activities related to its care. | 2.4 Demonstrate an increased awareness and the ability to discuss in simple terms how to care for the environment, and participate in activities related to its care. |
### Mathematics

#### Number Sense

<table>
<thead>
<tr>
<th></th>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Children begin to understand numbers and quantities in their everyday environment.</td>
<td>Children expand their understanding of numbers and quantities in their everyday environment.</td>
</tr>
<tr>
<td>1.1</td>
<td>Recite numbers in order to ten with increasing accuracy.</td>
<td>Recite numbers in order to twenty with increasing accuracy.</td>
</tr>
<tr>
<td>1.2</td>
<td>Begin to recognize and name a few written numerals.</td>
<td>Recognize and know the name of some written numerals.</td>
</tr>
<tr>
<td>1.3</td>
<td>Identify, without counting, the number of objects in a collection of up to three objects (i.e., subitize).</td>
<td>Identify, without counting, the number of objects in a collection of up to four objects (i.e., subitize).</td>
</tr>
<tr>
<td>1.4</td>
<td>Count up to five objects, using one-to-one correspondence (one object for each number word) with increasing accuracy.</td>
<td>Count up to ten objects, using one-to-one correspondence (one object for each number word) with increasing accuracy.</td>
</tr>
<tr>
<td>1.5</td>
<td>Use the number name of the last object counted to answer the question, &quot;How many . . . ?&quot;</td>
<td>Understand, when counting, that the number name of the last object counted represents the total number of objects in the group (i.e., cardinality).</td>
</tr>
<tr>
<td>2.0</td>
<td>Children begin to understand number relationships and operations in their everyday environment.</td>
<td>Children expand their understanding of number relationships and operations in their everyday environment.</td>
</tr>
<tr>
<td>2.1</td>
<td>Compare visually (with or without counting) two groups of objects that are obviously equal or nonequal and communicate, &quot;more&quot; or &quot;same.&quot;</td>
<td>Compare, by counting or matching, two groups of up to five objects and communicate, &quot;more,&quot; &quot;same as,&quot; or &quot;fewer&quot; (or &quot;less&quot;).</td>
</tr>
<tr>
<td>2.2</td>
<td>Understand that adding to (or taking away) one or more objects from a group will increase (or decrease) the number of objects in the group.</td>
<td>Understand that adding one or taking away one changes the number in a small group of objects by exactly one.</td>
</tr>
</tbody>
</table>

Copyright © 2008 California Department of Education, Early Education and Support Division (formerly CDD)
<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.3</strong> Understand that putting two groups of objects together will make a bigger group.</td>
<td><strong>2.3</strong> Understand that putting two groups of objects together will make a bigger group and that a group of objects can be taken apart into smaller groups.</td>
</tr>
<tr>
<td><strong>2.4</strong> Solve simple addition and subtraction problems nonverbally (and often verbally) with a very small number of objects (sums up to 4 or 5).</td>
<td><strong>2.4</strong> Solve simple addition and subtraction problems with a small number of objects (sums up to 10), usually by counting.</td>
</tr>
</tbody>
</table>

### Algebra and Functions
(Classification and Patterning)

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong> Children begin to sort and classify objects in their everyday environment.</td>
<td><strong>1.0</strong> Children expand their understanding of sorting and classifying objects in their everyday environment.</td>
</tr>
<tr>
<td><strong>1.1</strong> Sort and classify objects by one attribute into two or more groups, with increasing accuracy.</td>
<td><strong>1.1</strong> Sort and classify objects by one or more attributes, into two or more groups, with increasing accuracy (e.g., may sort first by one attribute and then by another attribute).</td>
</tr>
<tr>
<td><strong>2.0</strong> Children begin to recognize simple, repeating patterns.</td>
<td><strong>2.0</strong> Children expand their understanding of simple, repeating patterns.</td>
</tr>
<tr>
<td><strong>2.1</strong> Begin to identify or recognize a simple repeating pattern.</td>
<td><strong>2.1</strong> Recognize and duplicate simple repeating patterns.</td>
</tr>
<tr>
<td><strong>2.2</strong> Attempt to create a simple repeating pattern or participate in making one.</td>
<td><strong>2.2</strong> Begin to extend and create simple repeating patterns.</td>
</tr>
</tbody>
</table>
### Measurement

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong> Children begin to compare and order objects.</td>
<td><strong>1.0</strong> Children expand their understanding of comparing, ordering, and measuring objects.</td>
</tr>
<tr>
<td><strong>1.1</strong> Demonstrate awareness that objects can be compared by length, weight, or capacity, by noting gross differences, using words such as <strong>bigger</strong>, <strong>longer</strong>, <strong>heavier</strong>, or <strong>taller</strong>, or by placing objects side by side to compare length.</td>
<td><strong>1.1</strong> Compare two objects by length, weight, or capacity directly (e.g., putting objects side by side) or indirectly (e.g., using a third object).</td>
</tr>
<tr>
<td><strong>1.2</strong> Order three objects by size.</td>
<td><strong>1.2</strong> Order four or more objects by size.</td>
</tr>
<tr>
<td><strong>1.3</strong> Measure length using multiple duplicates of the same-size concrete units laid end to end.</td>
<td></td>
</tr>
</tbody>
</table>

### Geometry

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong> Children begin to identify and use common shapes in their everyday environment.</td>
<td><strong>1.0</strong> Children identify and use a variety of shapes in their everyday environment.</td>
</tr>
<tr>
<td><strong>1.1</strong> Identify simple two-dimensional shapes, such as a circle and square.</td>
<td><strong>1.1</strong> Identify, describe, and construct a variety of different shapes, including variations of a circle, triangle, rectangle, square, and other shapes.</td>
</tr>
<tr>
<td><strong>1.2</strong> Use individual shapes to represent different elements of a picture or design.</td>
<td><strong>1.2</strong> Combine different shapes to create a picture or design.</td>
</tr>
<tr>
<td><strong>2.0</strong> Children begin to understand positions in space.</td>
<td><strong>2.0</strong> Children expand their understanding of positions in space.</td>
</tr>
<tr>
<td><strong>2.1</strong> Identify positions of objects and people in space, such as in/on/under, up/down, and inside/outside.</td>
<td><strong>2.1</strong> Identify positions of objects and people in space, including in/on/under, up/down, inside/outside, beside/between, and in front/behind.</td>
</tr>
</tbody>
</table>
### Mathematical Reasoning

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong> Children use mathematical thinking to solve problems that arise in their everyday environment.</td>
<td><strong>1.0</strong> Children expand the use of mathematical thinking to solve problems that arise in their everyday environment.</td>
</tr>
<tr>
<td><strong>1.1</strong> Begin to apply simple mathematical strategies to solve problems in their environment.</td>
<td><strong>1.1</strong> Identify and apply a variety of mathematical strategies to solve problems in their environment.</td>
</tr>
</tbody>
</table>

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## Language and Literacy

### Listening and Speaking

#### 1.0 Language Use and Conventions

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> Use language to communicate with others in familiar social situations for a variety of basic purposes, including describing, requesting, commenting, acknowledging, greeting, and rejecting.</td>
<td><strong>1.1</strong> Use language to communicate with others in both familiar and unfamiliar social situations for a variety of basic and advanced purposes, including reasoning, predicting, problem solving, and seeking new information.</td>
</tr>
<tr>
<td><strong>1.2</strong> Speak clearly enough to be understood by familiar adults and children.</td>
<td><strong>1.2</strong> Speak clearly enough to be understood by both familiar and unfamiliar adults and children.</td>
</tr>
<tr>
<td><strong>1.3</strong> Use accepted language and style during communication with familiar adults and children.</td>
<td><strong>1.3</strong> Use accepted language and style during communication with both familiar and unfamiliar adults and children.</td>
</tr>
<tr>
<td><strong>1.4</strong> Use language to construct short narratives that are real or fictional.</td>
<td><strong>1.4</strong> Use language to construct extended narratives that are real or fictional.</td>
</tr>
</tbody>
</table>

#### 2.0 Vocabulary

<table>
<thead>
<tr>
<th>2.1 Understand and use accepted words for objects, actions, and attributes encountered frequently in both real and symbolic contexts.</th>
<th>2.1 Understand and use an increasing variety and specificity of accepted words for objects, actions, and attributes encountered in both real and symbolic contexts.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.2</strong> Understand and use accepted words for categories of objects encountered and used frequently in everyday life.</td>
<td><strong>2.2</strong> Understand and use accepted words for categories of objects encountered in everyday life.</td>
</tr>
<tr>
<td><strong>2.3</strong> Understand and use simple words that describe the relations between objects.</td>
<td><strong>2.3</strong> Understand and use both simple and complex words that describe the relations between objects.</td>
</tr>
</tbody>
</table>
### 3.0 Grammar

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Understand and use increasingly complex and longer sentences, including sentences that combine two phrases or two to three concepts to communicate ideas.</td>
<td>3.1 Understand and use increasingly complex and longer sentences, including sentences that combine two to three phrases or three to four concepts to communicate ideas.</td>
</tr>
<tr>
<td>3.2 Understand and typically use age-appropriate grammar, including accepted word forms, such as subject-verb agreement, progressive tense, regular past tense, regular plurals, pronouns, and possessives.</td>
<td>3.2 Understand and typically use age-appropriate grammar, including accepted word forms, such as subject-verb agreement, progressive tense, regular and irregular past tense, regular and irregular plurals, pronouns, and possessives.</td>
</tr>
</tbody>
</table>

### Reading

#### 1.0 Concepts about Print

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Begin to display appropriate book-handling behaviors and begin to recognize print conventions.</td>
<td>1.1 Display appropriate book-handling behaviors and knowledge of print conventions.</td>
</tr>
<tr>
<td>1.2 Recognize print as something that can be read.</td>
<td>1.2 Understand that print is something that is read and has specific meaning.</td>
</tr>
</tbody>
</table>

#### 2.0 Phonological Awareness

| 2.1 Orally blend and delete words and syllables without the support of pictures or objects. | 2.2 Orally blend the onsets, rimes, and phonemes of words and orally delete the onsets of words, with the support of pictures or objects. |
### 3.0 Alphabets and Word/Print Recognition

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Recognize the first letter of own name.</td>
<td>3.1 Recognize own name or other common words in print.</td>
</tr>
<tr>
<td>3.2 Match some letter names to their printed form.</td>
<td>3.2 Match more than half of uppercase letter names and more than half of lowercase letter names to their printed form.</td>
</tr>
<tr>
<td>3.3 Begin to recognize that letters have sounds.</td>
<td></td>
</tr>
</tbody>
</table>

### 4.0 Comprehension and Analysis of Age-Appropriate Text

<table>
<thead>
<tr>
<th>4.1 Demonstrate knowledge of main characters or events in a familiar story (e.g., who, what, where) through answering questions (e.g., recall and simple inferencing), retelling, reenacting, or creating artwork.</th>
<th>4.1 Demonstrate knowledge of details in a familiar story, including characters, events, and ordering of events through answering questions (particularly summarizing, predicting, and inferencing), retelling, reenacting, or creating artwork.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 Demonstrate knowledge from informational text through labeling, describing, playing, or creating artwork.</td>
<td>4.2 Use information from informational text in a variety of ways, including describing, relating, categorizing, or comparing and contrasting.</td>
</tr>
</tbody>
</table>

### 5.0 Literacy Interest and Response

<table>
<thead>
<tr>
<th>5.1 Demonstrate enjoyment of literacy and literacy-related activities.</th>
<th>5.1 Demonstrate, with increasing independence, enjoyment of literacy and literacy-related activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2 Engage in routines associated with literacy activities.</td>
<td>5.2 Engage in more complex routines associated with literacy activities.</td>
</tr>
</tbody>
</table>

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### Writing

#### 1.0 Writing Strategies

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Experiment with grasp and body position using a variety of drawing and writing tools.</td>
<td>1.1 Adjust grasp and body position for increased control in drawing and writing.</td>
</tr>
<tr>
<td>1.2 Write using scribbles that are different from pictures.</td>
<td>1.2 Write letters or letter-like shapes to represent words or ideas.</td>
</tr>
<tr>
<td>1.3 Write marks to represent own name.</td>
<td>1.3 Write first name nearly correctly.</td>
</tr>
</tbody>
</table>

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Science: 
Key Vocabulary in Science and Mathematics

Begin by placing in the box for each science strand the key vocabulary you find in the foundations for that strand. Next look across the mathematics strands and find similar vocabulary or concepts that relate to the science vocabulary. Then be prepared to discuss these two questions:

1. How will knowing key vocabulary related to the three science strands support and strengthen children’s development and learning in the mathematics strands?
2. How will mathematics vocabulary support learning and development in the science strands?

<table>
<thead>
<tr>
<th>Number Sense</th>
<th>Algebra and Functions</th>
<th>Measurement</th>
<th>Geometry</th>
<th>Mathematical Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Sciences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Life Sciences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Earth Sciences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Science

Scientific Inquiry
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

Physical Sciences
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

Read through the summary of the science domain.

Develop a list of key vocabulary that young children would need to know in order to describe, ask questions, respond to questions, predict, or record observations about things and events that are the content of each of these strands.
Science Vocabulary in Science and Mathematics

<table>
<thead>
<tr>
<th>Number Sense</th>
<th>Algebras and Functions</th>
<th>Measurement</th>
<th>Geometry</th>
<th>Mathematical Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earth Sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How does knowing key vocabulary relating to the science strands support and strengthen children’s development and learning in the mathematics strands?

How will mathematics vocabulary support learning and development in the science strands?
Science

Vocabulary in Science and Mathematics

• Where did you find similarities in the vocabulary of these two domains?
• What is a difference in how these similar key vocabularies are used in these two domains?

Science

• Develop a list of key skills from the Scientific Inquiry strand.
• Look through the strands and substrands of the language and literacy domain.
• How would achieving the foundations in the language and literacy domain support the achievement of the skills found in the foundations in the Scientific Inquiry strand in the science domain?
Science

- What discoveries did you make while you were doing this?
- Did some strands or domains have stronger relationships than others?

Science

- What new ideas about early learning and development emerged?
- What more do you want to find out about regarding the domains you worked with? How could you get that information?
Science:
Exploring Relationships of the Science Domain to the Physical Development Domain and the Health Domain

Focus Statement

Students explore the relationships between the foundations of the science domain and those of the physical development and health domains by creating a visual representation showing how the behaviors demonstrated by children for the foundations in one of the science strands might relate to behaviors in a strand of the physical development or health domain.

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 Growth and Development
- Health, Safety and Nutrition
- Practicum-Field Experience

Instructional Methodologies

- Brainstorming
- Class discussion
- Class presentation
- Creation of a visual representation
- Pairs or small groups
- Peer review and feedback
- 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.

- Child Development and Learning
- Special Needs and Inclusion
- Learning Environments and Curriculum
- Health, Safety, and Nutrition
- Professionalism
Science: Exploring Relationships of the Science Domain to the Physical Development Domain and the Health Domain

Before You Start

Volume 3 of the California Preschool Learning Foundations presents the final two domains of early learning and development produced by the California Department of Education as part of its early learning system. The foundations are the heart of this system (California Preschool Learning Foundations, Volume 3, p. xvi), and this volume provides a unique opportunity for students to become acquainted with all nine domains. There are four learning experiences in this instructional guide that, when used as a set, can provide opportunities for students to explore all nine domains and some of the ways in which they relate to one another. These experiences are not exhaustive cross-linking of all domains but provide opportunities to work with some selected relationships that strongly represent the integrated nature of early development. Each of these learning experiences focuses on one of the two domains in the California Preschool Learning Foundations, Volume 3 and a domain or selected set of domains from either the California Preschool Learning Foundations, Volume 1 or California Preschool Learning Foundations, Volume 2.

Depending on the emphasis of any particular course, any of these four learning experiences can be used independently of the others or all four can be used in sequence or combination. The following list of these four learning experiences describes the domains addressed in each one:


- Science domain, Learning Experience 11—“Exploring the Relationship off the Science Domain to the Mathematics Domain and the Language and Literacy Domain”—focuses on the relation of the science domain in Volume 3 to the mathematics and language and literacy domains in Volume 1.
• Science domain, Learning Experience 12—“Exploring Relationships of the Science Domain to the Physical Development Domain and the Health Domain”—focuses on the relationship of the science domain to the domains of physical development and health in Volume 2.

Thus each of the nine domains is explored in relation to at least one other domain, and the domains in Volume 3 are highlighted. The specific domains explored in relation to one another are grouped in a way that highlights strong relationships between the strands of these domains. This is intended to support an understanding by students of how these various domains in the foundations are integrated in early learning and development.

Each of the four learning experiences guides students through domains using different instructional methodologies. These methodologies could be used as presented or used flexibly across several sets of domains. For example the charting experience described in the history-social science Learning Experience 11 could be used for any number or combination of strands across any number of domains.

This learning experience explores relationships of the science domain to the domains of physical development and health in Volume 2. All strands in the physical development and health domains are not explored in this learning experience. In the science domain, the strand of Scientific Inquiry is not included here. This is an extremely important strand for students to know about, and they can explore this strand with Learning Experience 11 included in this instructional guide, entitled “Exploring the Relationship of the Science Domain to the Mathematics Domain and the Language and Literacy Domain.”

It will be easier for students to engage with the work in this learning experience if they are familiar with the science domain. If students have not had experience with the science domain, Learning Experience 3 in this instructional guide entitled “Piecing Together the Science Domain Content Puzzle” would be helpful in introducing them to the domain.

Handouts of the foundations for the science (Handout 1), physical development (Handout 2), and health (Handout 3) domains are provided with this learning experience. Electronic versions of these handouts will be available when this instructional guide is online at www.wested.org/facultyinitiative.

Make sure that students have read through the Introduction to the science domain, pages 48–60 of the California Preschool Learning Foundations, Volume 3 before beginning this experience. They can do this in class or out. If they have had experience with this domain, students can also be led through a review of the science domain by reading the summary provided as Handout 1 with this learning experience or finding it in the publication on pages 108–112.
Getting it started
Organize students into pairs or groups of three. Make sure each group has a copy of the summary of the science foundations, either within the publication (pp 108–112) or the summary provided as Handout 1 with this learning experience. They will also need to look at the summaries of the physical development domain (Handout 2) and the health domain foundations (Handout 3) in Volume 2. These handouts are also included with this learning experience.

Let students know that they will be developing a visual representation of the relationships between some strands of the science domain in Volume 3 of the California Preschool Learning Foundations and the domains of physical development and health in Volume 2 of the California Preschool Learning Foundations. Instructors can organize students and strands of these two domains in any way the instructor chooses, but the suggestion in the following table is based on where content of the science domain and of the physical development or health domains might provide some potentially interesting relationships for students. They will have to think about the concepts behind the behaviors in these strands as well as the behaviors themselves, and they might need some time to develop their visual representations of these.

<table>
<thead>
<tr>
<th>Science Domain</th>
<th>Physical Development Domain and Health Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Sciences</td>
<td>Physical Development</td>
</tr>
<tr>
<td>Substrand: Properties and Characteristics</td>
<td>Substrand: Fundamental Movement Skills</td>
</tr>
<tr>
<td>of Nonliving Objects and Materials</td>
<td></td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>Physical Development</td>
</tr>
<tr>
<td>Substrand: Changes in Nonliving Objects</td>
<td>Substrand: Perceptual-Motor Skills and</td>
</tr>
<tr>
<td>and Materials</td>
<td>Movement Concepts</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>Physical Development</td>
</tr>
<tr>
<td>Substrand: Properties and Characteristics</td>
<td>Substrand: Active Physical Play</td>
</tr>
<tr>
<td>of Living Things</td>
<td></td>
</tr>
<tr>
<td>Life Sciences</td>
<td>Health</td>
</tr>
<tr>
<td>Substrand: Changes in Living Things</td>
<td>Substrand: Health Habits</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>Physical Development</td>
</tr>
<tr>
<td>Substrand: Properties and Characteristics</td>
<td>Substrand: Fundamental Movement Skills</td>
</tr>
<tr>
<td>of Earth Materials and Objects</td>
<td></td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>Health</td>
</tr>
<tr>
<td>Substrand: Changes in the Earth</td>
<td>Substrands: Safety and Nutrition</td>
</tr>
</tbody>
</table>
Keeping it going
Let students know that they are not looking for exact matches in the content but ways in which the foundations of several strands might play out in some behaviors typical of young children. The examples might be helpful to students here. Remind students that they need not represent everything in any strand or substrand, but they will need to spend time getting to know the strands with which they are working.

Suggest that they think about how we could observe a strand—for example, injury prevention—in a situation where children show an awareness of properties and characteristics of the earth. Encourage students to brainstorm and be creative and enjoy the exercise. And remind them that the main point of this exercise is to learn about the foundations!

Their visual representations can be two- or three-dimensional, pictorial, collage, or whatever they can create. Including words or phrases can sometimes be helpful.

Putting it together
After students have had some time to work on their creations, create a gallery situation where they can all view each other’s work. This might be on tabletops or around the walls of a classroom. As they view the work, ask them to carry writing materials and write a question to ask of each group about their work. When the viewing is done, convene the class as a whole group and have students ask each group the questions they have written. In responding, each group should be able to make some reference to the strands or foundations that they were working with.

Reflection

When students have finished their gallery walk and have a chance to discuss their observations as a whole class, ask them to reflect on their experience with the following questions:

• What discoveries did you make while you were doing this?
• Where were the greatest challenges? How did you overcome them?
• What new ideas about early learning and development emerged?
• What more do you want to find out about regarding the domains you worked with? How could you get that information?
## Science

### Scientific Inquiry

1.0 **Observation and Investigation**

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
<td>1.1 Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td>1.2 Observe objects and events in the environment and describe them.</td>
<td>1.2 Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td>1.3 Begin to identify and use, with adult support, some observation and measurement tools.</td>
<td>1.3 Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td>1.4 Compare and contrast objects and events and begin to describe similarities and differences.</td>
<td>1.4 Compare and contrast objects and events and describe similarities and differences in greater detail.</td>
</tr>
<tr>
<td>1.5 Make predictions and check them, with adult support, through concrete experiences.</td>
<td>1.5 Demonstrate an increased ability to make predictions and check them (e.g., may make more complex predictions, offer ways to test predictions, and discuss why predictions were correct or incorrect).</td>
</tr>
<tr>
<td>1.6 Make inferences and form generalizations based on evidence.</td>
<td>1.6 Demonstrate an increased ability to make inferences and form generalizations based on evidence.</td>
</tr>
</tbody>
</table>

1. Other related scientific processes, such as classifying, ordering, and measuring, are addressed in the foundations for mathematics.

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2.0 Documentation and Communication

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Record observations or findings in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos.</td>
<td>2.1 Record information more regularly and in greater detail in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, photos, or by tallying and graphing information.</td>
</tr>
<tr>
<td>2.2 Share findings and explanations, which may be correct or incorrect, with or without adult prompting.</td>
<td>2.2 Share findings and explanations, which may be correct or incorrect, more spontaneously and with greater detail.</td>
</tr>
</tbody>
</table>

Physical Sciences

1.0 Properties and Characteristics of Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Observe, investigate, and identify the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
<td>1.1 Demonstrate increased ability to observe, investigate, and describe in greater detail the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
</tr>
</tbody>
</table>

2.0 Changes in Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Demonstrate awareness that objects and materials can change; explore and describe changes in objects and materials (rearrangement of parts; change in color, shape, texture, temperature).</td>
<td>2.1 Demonstrate an increased awareness that objects and materials can change in various ways. Explore and describe in greater detail changes in objects and materials (rearrangement of parts; change in color, shape, texture, form, and temperature).</td>
</tr>
</tbody>
</table>
### Life Sciences

#### 1.0 Properties and Characteristics of Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
<td>1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>1.2 Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
<td>1.2 Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
</tr>
<tr>
<td>1.3 Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.</td>
<td>1.3 Recognize that living things have habitats in different environments suited to their unique needs.</td>
</tr>
<tr>
<td>1.4 Indicate knowledge of the difference between animate objects (animals, people) and inanimate objects. For example, expect animate objects to initiate movement and to have different insides than inanimate objects.</td>
<td>1.4 Indicate knowledge of the difference between animate and inanimate objects, providing greater detail, and recognize that only animals and plants undergo biological processes such as growth, illness, healing, and dying.</td>
</tr>
</tbody>
</table>

---

2. The knowledge of body parts is also addressed in the *California Preschool Foundations (Volume 2)* for health. In science, it also includes the knowledge of body processes. Knowledge of body parts is extended to those of humans and other animals.

---

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## 2.0 Changes in Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1</strong> Observe and explore growth and changes in humans, animals, and plants and demonstrate an understanding that living things change over time in size and in other capacities as they grow.</td>
<td><strong>2.1</strong> Observe and explore growth in humans, animals, and plants and demonstrate an increased understanding that living things change as they grow and go through transformations related to the life cycle (for example, from a caterpillar to butterfly).</td>
</tr>
<tr>
<td><strong>2.2</strong> Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.</td>
<td><strong>2.2</strong> Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).</td>
</tr>
</tbody>
</table>

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# Earth Sciences

## 1.0 Properties and Characteristics of Earth Materials and Objects

<table>
<thead>
<tr>
<th></th>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
<td>1.1 Demonstrate increased ability to investigate and compare characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
</tr>
</tbody>
</table>

## 2.0 Changes in the Earth

<table>
<thead>
<tr>
<th></th>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Observe and describe natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change.</td>
<td>2.1 Demonstrate an increased ability to observe and describe natural objects in the sky and to notice patterns of movement and apparent changes in the sun and the moon.</td>
</tr>
<tr>
<td>2.2</td>
<td>Notice and describe changes in weather.</td>
<td>2.2 Demonstrate an increased ability to observe, describe, and discuss changes in weather.</td>
</tr>
<tr>
<td>2.3</td>
<td>Begin to notice the effects of weather and seasonal changes on their own lives and on plants and animals.</td>
<td>2.3 Demonstrate an increased ability to notice and describe the effects of weather and seasonal changes on their own lives and on plants and animals.</td>
</tr>
<tr>
<td>2.4</td>
<td>Develop awareness of the importance of caring for and respecting the environment and participate in activities related to its care.</td>
<td>2.4 Demonstrate an increased awareness and the ability to discuss in simple terms how to care for the environment, and participate in activities related to its care.</td>
</tr>
</tbody>
</table>
### Physical Development

#### Fundamental Movement Skills

<table>
<thead>
<tr>
<th>1.0 Balance</th>
<th>2.0 Locomotor Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At around 48 months of age</strong></td>
<td><strong>At around 60 months of age</strong></td>
</tr>
<tr>
<td>1.1 Maintain balance while holding still; sometimes may need assistance.</td>
<td>1.1 Show increasing balance and control when holding still.</td>
</tr>
<tr>
<td>1.2 Maintain balance while in motion when moving from one position to another or when changing directions, though balance may not be completely stable.</td>
<td>1.2 Show increasing balance control while moving in different directions and when transitioning from one movement or position to another.</td>
</tr>
<tr>
<td>2.1 Walk with balance, not always stable, oppositional arm movements still developing, and relatively wide base of support (space between feet).</td>
<td>2.1 Walk with balance, oppositional arm movements, and relatively narrow base of support (space between feet).</td>
</tr>
<tr>
<td>2.2 Run with short stride length and feet off the ground for a short period of time. May show inconsistent opposition of arms and legs.</td>
<td>2.2 Run with a longer stride length and each foot off the ground for a greater length of time. Opposition of arms and legs is more consistent.</td>
</tr>
<tr>
<td>2.3 Jump for height (up or down) and for distance with beginning competence.</td>
<td>2.3 Jump for height (up or down) and for distance with increasing competence. Uses arm swing to aid forward jump.</td>
</tr>
<tr>
<td>2.4 Begin to demonstrate a variety of locomotor skills, such as galloping, sliding, hopping, and leaping.</td>
<td>2.4 Demonstrate increasing ability and body coordination in a variety of locomotor skills, such as galloping, sliding, hopping, and leaping.</td>
</tr>
</tbody>
</table>
### 3.0 Manipulative Skills

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Begin to show gross motor manipulative skills by using arms, hands, and feet, such as rolling a ball underhand, tossing underhand, bouncing, catching, striking, throwing overhand, and kicking.</td>
<td>3.1 Show gross motor manipulative skills by using arms, hands, and feet with increased coordination, such as rolling a ball underhand, tossing underhand, bouncing, catching, striking, throwing overhand, and kicking.</td>
</tr>
<tr>
<td>3.2 Begin to show fine motor manipulative skills using hands and arms such as in-hand manipulation, writing, cutting, and dressing.</td>
<td>3.2 Show increasing fine motor manipulative skills using hands and arms such as in-hand manipulation, writing, cutting, and dressing.</td>
</tr>
</tbody>
</table>

### Perceptual-Motor Skills and Movement Concepts

#### 1.0 Body Awareness

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Demonstrate knowledge of the names of body parts.</td>
<td>1.1 Demonstrate knowledge of an increasing number of body parts.</td>
</tr>
</tbody>
</table>

#### 2.0 Spatial Awareness

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Use own body as reference point when locating or relating to other people or objects in space.</td>
<td>2.1 Use own body, general space, and other people's space when locating or relating to other people or objects in space.</td>
</tr>
</tbody>
</table>

#### 3.0 Directional Awareness

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Distinguish movements that are up and down and to the side of the body (for example, understands “use that side, now the other side”).</td>
<td>3.1 Begin to understand and distinguish between the sides of the body.</td>
</tr>
<tr>
<td>3.2 Move forward and backward or up and down easily.</td>
<td>3.2 Can change directions quickly and accurately.</td>
</tr>
</tbody>
</table>
### 3.0 Directional Awareness (Continued)

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.3</strong> Can place an object on top of or under something with some accuracy.</td>
<td><strong>3.3</strong> Can place an object or own body in front of, to the side, or behind something else with greater accuracy.</td>
</tr>
<tr>
<td><strong>3.4</strong> Use any two body parts together.</td>
<td><strong>3.4</strong> Demonstrate more precision and efficiency during two-handed fine motor activities.</td>
</tr>
</tbody>
</table>

### Active Physical Play

#### 1.0 Active Participation

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> Initiate or engage in simple physical activities for a short to moderate period of time.</td>
<td><strong>1.1</strong> Initiate more complex physical activities for a sustained period of time.</td>
</tr>
</tbody>
</table>

#### 2.0 Cardiovascular Endurance

| **2.1** Engage in frequent bursts of active play that involves the heart, the lungs, and the vascular system. | **2.1** Engage in sustained active play of increasing intensity that involves the heart, the lungs, and the vascular system. |

#### 3.0 Muscular Strength, Muscular Endurance, and Flexibility

| **3.1** Engage in active play activities that enhance leg and arm strength, muscular endurance, and flexibility. | **3.1** Engage in increasing amounts of active play activities that enhance leg and arm strength, muscular endurance, and flexibility. |
### Health

#### Health Habits

<table>
<thead>
<tr>
<th>1.0 Basic Hygiene</th>
<th>1.1 Demonstrate knowledge of some steps in the handwashing routine.</th>
</tr>
</thead>
<tbody>
<tr>
<td>At around 48 months of age</td>
<td>At around 60 months of age</td>
</tr>
<tr>
<td>1.2 Practice health habits that prevent infectious diseases and infestations (such as lice) when appropriate, with adult support, instruction, and modeling.</td>
<td>1.2 Begin to independently practice health habits that prevent infectious disease and infestations (such as lice) when appropriate, with less adult support, instruction, and modeling.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.0 Oral Health</th>
<th>2.1 Demonstrate knowledge of some steps of the routine for brushing teeth, with adult supervision and instruction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Demonstrate knowledge of some steps of the routine for brushing teeth, with adult supervision and instruction.</td>
<td>2.1 Demonstrate knowledge of more steps of the routine for brushing and when toothbrushing should be done, with less adult supervision.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.0 Knowledge of Wellness</th>
<th>3.1 Identify several different internal body parts and demonstrate a basic, limited knowledge of some functions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Identify a few internal body parts (most commonly the bones, brain, and heart) but may not understand their basic function.</td>
<td>3.2 Demonstrate greater understanding that health-care providers try to keep people well and help them when they are not well.</td>
</tr>
<tr>
<td>3.2 Begin to understand that health-care providers try to keep people well and help them when they are not well.</td>
<td>3.3 Communicate to an adult about not feeling well, feeling uncomfortable, or about a special health need, with varying specificity and reliability.</td>
</tr>
<tr>
<td>3.3 Communicate to an adult about not feeling well, feeling uncomfortable, or about a special health need, with more specificity and reliability.</td>
<td>3.3 Communicate to an adult about not feeling well, feeling uncomfortable, or about a special health need, with more specificity and reliability.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.0 Sun Safety</th>
<th>4.1 Practice sun-safe actions with decreasing adult support and guidance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Begin to practice sun-safe actions, with adult support and guidance.</td>
<td>4.1 Practice sun-safe actions with decreasing adult support and guidance.</td>
</tr>
</tbody>
</table>

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### Safety

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Follow safety rules with adult support and prompting.</td>
<td>1.1 Follow safety rules more independently though may still need adult support and prompting.</td>
</tr>
<tr>
<td>1.2 Begin to show ability to follow emergency routines after instruction and practice (for example, a fire drill or earthquake drill).</td>
<td>1.2 Demonstrate increased ability to follow emergency routines after instruction and practice.</td>
</tr>
<tr>
<td>1.3 Show beginning ability to follow transportation and pedestrian safety rules with adult instruction and supervision.</td>
<td>1.3 Show increased ability to follow transportation and pedestrian safety rules with adult support and supervision.</td>
</tr>
</tbody>
</table>

### Nutrition

#### 1.0 Nutrition Knowledge

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify different kinds of foods.</td>
<td>1.1 Identify a larger variety of foods and may know some of the related food groups.</td>
</tr>
</tbody>
</table>

#### 2.0 Nutrition Choices

| 2.1 Demonstrate a beginning understanding that eating a variety of food helps the body grow and be healthy, and choose from a variety of foods at mealtimes. | 2.1 Demonstrate greater understanding that eating a variety of food helps the body grow and be healthy, and choose from a greater variety of foods at mealtimes. |
| 2.2 Indicate food preferences that reflect familial and cultural practices. | 2.2 Indicate food preferences based on familial and cultural practices and on some knowledge of healthy choices. |

#### 3.0 Self-Regulation of Eating

| 3.1 Indicate awareness of own hunger and fullness. | 3.1 Indicate greater awareness of own hunger and fullness. |
Science

Scientific Inquiry
(skills and language related to science)
1.0 Observation and Investigation
2.0 Documentation and Communication

Physical Sciences
1.0 Properties and Characteristics of Nonliving Objects and Materials
2.0 Changes in Nonliving Objects and Materials
Science

Life Sciences
1.0 Properties and Characteristics of Living Things
2.0 Changes in Living Things

Earth Sciences
1.0 Properties and Characteristics of Earth Materials and Objects
2.0 Changes in the Earth

- Read the summaries of the science foundations, the physical development domain, and the health domain.

- Develop a visual representation of the relationships between some strands of the science domain and the domains of physical development and health.
### Science

<table>
<thead>
<tr>
<th>Science Domain</th>
<th>Physical Development Domain and Health Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Sciences</strong> Substrand: Properties and Characteristics of Nonliving Objects and Materials</td>
<td><strong>Physical Development</strong> Substrand: Fundamental Movement and Skills</td>
</tr>
<tr>
<td><strong>Physical Sciences</strong> Substrand: Changes in Nonliving Objects and Materials</td>
<td><strong>Physical Development</strong> Substrand: Perceptual-Motor Skills and Movement Concepts</td>
</tr>
<tr>
<td><strong>Life Sciences</strong> Substrand: Properties and Characteristics of Living Things</td>
<td><strong>Physical Development</strong> Substrand: Active Physical Play</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Science Domain</th>
<th>Physical Development Domain and Health Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Life Sciences</strong> Substrand: Changes in Living Things</td>
<td><strong>Health</strong> Substrand: Health Habits</td>
</tr>
<tr>
<td><strong>Earth Sciences</strong> Substrand: Properties and Characteristics of Earth Materials and Objects</td>
<td><strong>Physical Development</strong> Substrand: Fundamental Movement Skills</td>
</tr>
<tr>
<td><strong>Earth Sciences</strong> Substrand: Changes in the Earth</td>
<td><strong>Health</strong> Substrands: Safety and Nutrition</td>
</tr>
</tbody>
</table>
Science

- What discoveries did you make while you were doing this?

- Where were the greatest challenges? How did you overcome them?

Science

- What new ideas about early learning and development emerged?

- What more do you want to find out about regarding the domains you worked with? How could you get that information?
Instructional Methodologies Definitions

Instructional Methodologies Definitions for the Instructional Guide for the California Preschool Learning Foundations, Volume 3

In this instructional guide, a variety of instructional methodologies have been suggested across all learning experiences. The intention is to provide instructors with access to diverse instructional methodologies that will enrich the experiences of their students and also support meeting program or college requirements for engaging students in a variety of methodologies. In the preview page(s) for each learning experience, the instructional methodologies that are used during that learning experience are listed. These methodologies are indexed in the Instructional Methodologies Index, so that instructors can make decisions based on which methodologies they prefer to use with their students. The following list provides working definitions for each of the methodologies referred to in the instructional guide. These working definitions provide instructors with an understanding of what is meant in this instructional guide by each term. They are not intended as definitive or exhaustive and refer only to the way in which they are used in this instructional guide.

Book review
Students are asked to indicate, in writing, how well they understood the contents of a book, how they think about it, and possibly how it connects to their work and/or experience.

Brainstorming
Students generate thoughts or ideas within a group without judgment as to the merits of what is generated.

Categorizing
Students put objects, thoughts, ideas, or concepts into groups based on overarching themes, theories, frameworks, likenesses, or differences.

Class discussion
All students participate in sharing of ideas/points of view, asking questions, and responding to others. This is often guided by an initial instructional question or prompt.

Class presentation
An individual student or small or larger group of students shares, performs, or presents material or a project that is related to an assigned or chosen topic.

Conversation grid
Students use a grid as a basis to facilitate discussion and learning. The conversation grid can be used to record notes, record answers, and/or raise additional questions.
Creation of a visual representation
Students develop a way to visually show a specific idea or concept. This can be a chart, table, graphic, poster, PowerPoint presentation, sculpture, collage, video, diorama, or any other medium that visually represents a concept, theory, practice, or idea.

Development of a resource tool
Students create a collection of relevant resources and/or information relating to a specific topic to be shared and used as a resource for other teachers or students.

Game
Students participate in interactive playful activities—focused on specific content or learning outcomes—that facilitate students’ exploration of a topic and/or skill.

Interview
Students conduct a question-and-answer session with a content expert, such as an early care and education professional or parent.

Jigsaw reading
Pairs or small groups of students are given sections of an article or text chapter to read and then find a creative and meaningful way to share the content with their peers.

Lecture
Instructors present an organized verbal presentation of ideas and/or information related to a specific topic. A PowerPoint presentation or other forms of visual support may accompany this.

Literature review
Students explore what a variety of authors have to say about a topic or question that is either selected by the student or assigned by the faculty.

Notetaking outline or guide
Students are provided with a form that supports their focus on the key points covered. This may be a form with the key points listed along with spaces for students to add information gained from the lecture, readings, or discussion or a form on which students list key points and add the information.

Observations
Students are asked to actively look at, listen to, and think about something, such as a classroom, child/ren, or teacher-child interactions. As observers, they do not participate in the setting or interfere with those around them. Observations may be conducted via video or in actual settings.

Pairs or small groups
Students are organized into pairs or groups of three to five for the purpose of completing a task such as having a discussion, solving a problem, preparing and implementing a presentation, and/or creating a resource or visual display.
Panel/guest speaker
Content experts come to class to share their knowledge and experiences on topics related to course content.

Peer review and feedback
Other individuals with similar characteristics—such as class members, co-teachers, or parents—review and share thoughts, identify strengths, and suggest areas of improvement with the peer member about his/her work, project, or presentation.

Personal reflection
An individual student or group of students engages in remembering details and thinking about an occurrence or experience. This requires one to consider one’s own role, behaviors, thoughts, and/or feelings in a particular situation or experience, as well as how one might apply the knowledge and understanding from the reflection to a new situation in the future.

Photo observation
Students explore a photograph, usually used to illustrate a concept or idea or to document an exercise or activity.

Problem solving
Students work on a solution to one or a series of tasks, questions, or problems. Problem solving may be done individually or as a group or class.

Reflective discussion
Following a learning experience, students engage in a discussion or talk about details and think about an event or experience that has occurred. The process requires students to consider their own role, behaviors, thoughts, and feelings in a particular situation or experience, as well as how one might apply the knowledge and understanding from the reflection to a new situation in the future. A reflective discussion might be facilitated by questions or prompts to guide and encourage participants to actively participate in reflection.

Role playing
Students take on a role in an activity and act it out.

Short paper or report
Students write a short paper that focuses on a specific topic or question.

Video observation
Students observe video for the purposes of documentation, understanding, and discussion.
Instructional Methodologies Index

Instructional Methodologies Indexed with the *Instructional Guide for the California Preschool Learning Foundations, Volume 3*

Each learning experience is written to include a variety of instructional methodologies. This is intended to provide varied learning experiences for students as they encounter the preschool learning foundations. It also provides another variable for faculty to use in deciding which learning experiences will best suit the needs of their students and programs.

In this instructional guide, these methodologies are identified for each learning experience on its preview page(s). The instructional methodologies and are also indexed so that faculty can get an overview of which methodologies are used across all domains and learning experiences.

To locate page numbers for each learning experience listed in the following index, refer to the instructional guide Table of Contents.
### Instructional Methodologies Indexed with the Instructional Guide for the California Preschool Learning Foundations, Volume 3

<table>
<thead>
<tr>
<th>Book Review</th>
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<th>Science Domain</th>
<th>Exploring the Overview of the Alignment Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Learning Experience 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Brainstorming
- Individual
- Pairs
- Small Group
- Large Group

<table>
<thead>
<tr>
<th>Brainstorming</th>
<th>History–Social Science Domain</th>
<th>Science Domain</th>
<th>Exploring the Overview of the Alignment Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Learning Experience 7</td>
<td></td>
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<td>• Learning Experience 8</td>
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<td>• Learning Experience 9</td>
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<tr>
<td>• Learning Experience 10</td>
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<tr>
<td>• Learning Experience 1</td>
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<td>• Learning Experience 7</td>
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<td>• Learning Experience 11</td>
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<td>• Learning Experience 12</td>
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</tbody>
</table>

### Categorizing

<table>
<thead>
<tr>
<th>Categorizing</th>
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<th>Science Domain</th>
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### Class Presentation
- Demonstration
- Oral Presentation
- Presentation
- Student Panel Presentation

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### Instructional Methodologies Indexed with the Instructional Guide for the California Preschool Learning Foundations, Volume 3

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Student Learning Outcomes Index

Student Learning Outcomes and CAP Lower Division Eight Courses
Mapped onto the Instructional Guide for the California Preschool Learning Foundations, Volume 3

To support faculty in deciding how and where they can best use the California Preschool Learning Foundations, Volume 3 in their course work or across their program, the Student Learning Outcomes (SLOs) developed by the Curriculum Alignment Project (CAP) for the eight core lower division early childhood courses have been mapped onto the learning experiences for each domain in this instructional guide. Each Learning Experience Preview Page provides course suggestions for instructor consideration.

More information about the Curriculum Alignment Project can be found on its website: http://www.childdevelopment.org/cs/cdsc/print/htdocs/services_cap.htm.

Appendix A is a listing of the suggested CAP lower division eight courses for all learning experiences in this instructional guide with the addition of the student learning outcomes, objectives, and examples of course content and topics. These SLOs are organized by the CAP core lower division early childhood courses.

This is not an exhaustive list, and faculty might find ways to use the learning experiences to address SLOs by means other than what has been indexed. Working through these selected learning experiences does not guarantee the achievement of any student learning outcome or objective; it is understood that students achieve student outcomes through repeated engagement with information and experiences that build competence.

To locate page numbers for each learning experience listed in the following index, refer to the Instructional Guide Table of Contents.

California State University and University of California

The Curriculum Alignment Project (CAP) course and student learning outcomes (SLO) mapping with this instructional guide is done with the understanding that not all institutions will use these particular SLOs or objectives. This is particularly true for faculty at the California State University (CSU) and University of California (UC) campuses. The SLOs do provide learning outcomes that can be used selectively or with adaptations for courses at the CSU and UC campuses and indicate what can be accomplished by students through using the key topic learning experiences in this instructional guide.
### Course: Child Growth and Development

<table>
<thead>
<tr>
<th>Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)</th>
<th>Instructional Guide Domains and Learning Experience in Which CAP Student Learning Outcomes Are Addressed</th>
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</thead>
<tbody>
<tr>
<td><strong>Course: Child Growth and Development</strong></td>
<td><strong>Science</strong></td>
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</table>
| Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development. | • Learning Experience 5  
• Learning Experience 6 |
| Identify cultural, economic, political, historical contexts that affect children’s development. | • Learning Experience 7 |
| Identify and compare major theoretical frameworks related to the study of human development. | • Learning Experience 12 |
| Apply developmental theory to child observations, surveys, and/or interviews using investigative research methodologies. | • Learning Experience 2 |
| Differentiate characteristics of typical and atypical development. | • Learning Experience 3  
• Learning Experience 7 |

**Additional Specific CAP Objectives and Course Content/Topics – See Appendix A**

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**Note to faculty: See Appendix A for a detailed list of the CAP Student Learning Outcomes, Objectives, and Course Content/Topics indicated for this instructional guide’s domains and learning experiences.**
Course: Child, Family and Community

<table>
<thead>
<tr>
<th>Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)</th>
<th>Instructional Guide Domains and Learning Experiences in Which CAP Student Learning Outcomes Are Addressed</th>
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</thead>
<tbody>
<tr>
<td><strong>Course: Child, Family and Community</strong></td>
<td><strong>Science</strong></td>
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</tbody>
</table>
| Analyze theories of socialization that address the interrelationship of child, family and community. | • Learning Experience 1  
• Learning Experience 7 |
| Assess the impact of educational, political, and socioeconomic factors on children and families. | |
| Describe social issues, changes, and transitions that affect children, families, schools, and communities. | |
| Describe effective strategies that empower families and encourage family involvement in children’s development. | • Learning Experience 8 |
| Identify and evaluate community support services and agencies available to families and children. | • Learning Experience 10 |
| Analyze one’s own values, goals and sense of self as related to family history and life experiences, assessing how this impacts relationships with children and families. | • Learning Experience 7 |
| Additional Specific CAP Objectives and Course Content/Topics – See Appendix A | |

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### Course: Introduction to Curriculum

<table>
<thead>
<tr>
<th>Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)</th>
<th>Instructional Guide Domains and Learning Experiences in Which CAP Student Learning Outcomes Are Addressed</th>
</tr>
</thead>
</table>
| **Recognize developmentally appropriate teaching strategies and apply them in supervised settings for young children.** | • Learning Experience 9  
• Learning Experience 10  
• Learning Experience 11 |
| **Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.** | • Learning Experience 1  
• Learning Experience 3  
• Learning Experience 10  
• Learning Experience 11 |
| **Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.** | • Learning Experience 2  
• Learning Experience 4  
• Learning Experience 5  
• Learning Experience 6  
• Learning Experience 8  
• Learning Experience 9 |
| **Use the ongoing cycle of curriculum development to plan, implement, and evaluate early childhood activities and environments.** |  |

Additional Specific CAP Objectives and Course Content/Topics – See Appendix A
### Course: Principles and Practices of Teaching Young Children

#### Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)

Student learning outcomes are matched to specific learning experiences in the instructional guide that will support attainment of that outcome.

<table>
<thead>
<tr>
<th>Course: Principles and Practices of Teaching Young Children</th>
<th>Instructional Guide Domains and Learning Experiences in Which CAP Student Learning Outcomes Are Addressed</th>
</tr>
</thead>
</table>
| Interpret best and promising teaching and care practices as defined within the field of early care and education’s history, range of delivery systems, program types and philosophies and ethical standards. | • Learning Experience 3  
• Learning Experience 4  
• Learning Experience 5 |
| Develop one’s teaching philosophy and professional goals. | • Learning Experience 1 |
| Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families. | • Learning Experience 7  
• Learning Experience 9  
• Learning Experience 10  
• Learning Experience 11 |
| Examine the value of play as a vehicle for developing skills, knowledge, dispositions, and strengthening relationships among young children. | • Learning Experience 2  
• Learning Experience 6  
• Learning Experience 8 |
| Examine a variety of guidance and interaction strategies to increase children’s social competence and promote a caring classroom community. | • Learning Experience 9 |
| Analyze the relationship between observation, planning, implementation and assessment in developing effective teaching strategies and positive learning and development. | • Learning Experience 6 |
| Additional Specific CAP Objectives and Course Content/Topics – See Appendix A | |

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**Course: Observation and Assessment**

<table>
<thead>
<tr>
<th>Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)</th>
<th>Instructional Guide Domains and Learning Experiences in Which CAP Student Learning Outcomes Are Addressed</th>
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</thead>
<tbody>
<tr>
<td>Student learning outcomes are matched to specific units, domains, and key topics in the instructional guide that will support attainment of that outcome.</td>
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**Course: Observation and Assessment**

<table>
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<tr>
<th><strong>Instructional Guide Domains and Learning Experiences in Which CAP Student Learning Outcomes Are Addressed</strong></th>
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- **Compare the purpose, value and use of formal and informal observation and assessment strategies.**
- **Evaluate the characteristics, strengths and limitations of common assessment tools.**
- **Complete systematic observations using a variety of methods of data collection to assess the impact of the environment, interactions, and curriculum on children’s development and behavior.**
- **Identify the role of partnerships with families and other professionals in utilizing interpretations of observational data to inform teaching practices.**

**Additional Specific CAP Objectives and Course Content/Topics – See Appendix A**
### Course: Health, Safety and Nutrition

<table>
<thead>
<tr>
<th>Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)</th>
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</thead>
<tbody>
<tr>
<td><strong>Course: Health, Safety and Nutrition</strong></td>
<td><strong>Science</strong></td>
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<tr>
<td>Assess strategies to maximize the mental and physical health of children and adults in accordance with culturally, linguistically and developmentally sound practice.</td>
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<tr>
<td>Identify health, safety, and environmental risks in children’s programs.</td>
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<tr>
<td>Analyze the nutritional needs of children at various ages and evaluate the relationship between healthy development and nutrition.</td>
<td>Learning Experience 12</td>
</tr>
<tr>
<td>Evaluate regulations, standards, policies and procedures related to health, safety, and nutrition in support of young children, teachers and families.</td>
<td></td>
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<tr>
<td>Discuss the value of collaboration with families and the community.</td>
<td></td>
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<tr>
<td>Additional Specific CAP Objectives and Course Content/Topics – See Appendix A</td>
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Course: Teaching in a Diverse Society

<table>
<thead>
<tr>
<th>Curriculum Alignment Project’s (CAP) Lower Division Eight Courses and Student Learning Outcomes (Revised February 2012)</th>
<th>Instructional Guide Domains and Learning Experiences in Which CAP Student Learning Outcomes Are Addressed</th>
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<td><strong>Course:</strong> Teaching in a Diverse Society</td>
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<tr>
<td>Critique the multiple societal impacts on young children’s social identity.</td>
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<tr>
<td>Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.</td>
<td>• Learning Experience 7 • Learning Experience 8</td>
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<tr>
<td>Critically assess the components of linguistically and culturally relevant, inclusive, age-appropriate, anti-bias approaches in promoting optimum learning and development.</td>
<td>• Learning Experience 4 • Learning Experience 7</td>
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<tr>
<td>Evaluate the impact of personal experiences and social identity on teaching effectiveness.</td>
<td>• Learning Experience 1</td>
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<tr>
<td>Additional Specific CAP Objectives and Course Content/Topics – See Appendix A</td>
<td></td>
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</table>
Course: Practicum-Field Experience

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Student learning outcomes are matched to specific units, domains, and key topics in the instructional guide that will support attainment of that outcome.</td>
<td>Science</td>
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**Course: Practicum-Field Experience**

- **Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.**
  - Learning Experience 2
  - Learning Experience 5
  - Learning Experience 6
  - Learning Experience 7
  - Learning Experience 9
  - Learning Experience 10
  - Learning Experience 11
  - Learning Experience 12

- **Evaluate the effectiveness of early childhood curriculum, classrooms, teaching strategies and how teachers involve families in their children’s development and learning to improve teaching practices for all children.**
  - Learning Experience 8

- **Design, implement and evaluate curriculum activities that are based on observation and assessment of young children.**

- **Apply a variety of effective approaches, strategies and techniques supporting positive relationships with children and adults.**

- **Critically assess one’s own teaching experiences to guide and inform practice.**
  - Learning Experience 1
  - Learning Experience 3
  - Learning Experience 4

**Additional Specific CAP Objectives and Course Content/Topics – See Appendix A**
# Appendix A

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Appendix A

Student Learning Outcomes and CAP Lower Division Eight Courses Mapped onto the Instructional Guide for the California Preschool Learning Foundations, Volume 3

To support faculty in decisions regarding how and where they can best use the California Preschool Learning Foundations, Volume 3 in their course work or across their program, the Student Learning Outcomes (SLOs) developed by the Curriculum Alignment Project (CAP) (http://www.childdevelopment.org/cs/cdtc/print/htdocs/services_cap.htm) for the eight core lower division early childhood courses have been mapped onto each learning experience in this instructional guide for consideration. Each Learning Experience Preview Page will provide the list of courses that have been mapped onto the specific learning experience.

The Curriculum Alignment Project's SLOs, objectives, and examples of course content and topics indicated for this instructional guide for the California Preschool Learning Foundations, Volume 3 are found in this Appendix A. Refer to the Student Learning Outcomes Index for an overview of this instructional guide mapping listed by domain. The location of the SLO Index is listed in the Table of Contents for this instructional guide.

These SLOs are organized by the CAP core lower division early childhood courses. This is not an exhaustive list, and faculty might find ways to use the learning experiences to address SLOs by means other than what has been indexed. Working through these selected learning experiences does not guarantee the achievement of any student learning outcome or objective; it is understood that students achieve student outcomes through repeated engagement with information and experiences that build competence.

To assist faculty in using these SLOs as supports for decision making, the instructional guide learning experiences are indexed first by California Preschool Learning Foundations, Volume 3 domains then by CAP courses and SLOs so that faculty can select what is most relevant to their particular needs. Student learning outcomes are matched to specific learning experiences in the instructional guide that will support attainment of that outcome. Not all student learning outcomes map onto the specific content of the instructional guide.

California State University and University of California

The Curriculum Alignment Project (CAP) course and student learning outcomes (SLO) mapping with this instructional guide is done with the understanding that not all institutions will use these particular SLOs or objectives. This is particularly true for faculty at the California State University (CSU) and University of California (UC) campuses. The SLOs do provide learning outcomes that can be used selectively or with adaptations for courses at the CSU and UC campuses and indicate what can be accomplished by students through using the learning experiences in this instructional guide.
History–Social Science Domain

History–Social Science – Learning Experience 1:

**Course: Child Growth and Development**

Student Learning Outcomes:
- Identify cultural, economic, political, historical contexts that affect children’s development.

Objectives:
- Identify and describe biological and environmental factors that influence children’s development from conception to adolescence across domains.

Content and Topics:
- Contemporary social issues that impact children’s development
- The role and influence of family and caregivers
- The role and influence cultural and societal impacts

**Course: Child, Family and Community**

Student Learning Outcomes:
- Analyze theories of socialization that address the interrelationship of child, family and community.
- Describe social issues, changes, and transitions that affect children, families, schools, and communities.

Objectives:
- Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
- Compare and contrast diverse family structures, parenting styles, culture, tradition and values and their impact upon children and youth.

Content and Topics:
- Interrelatedness of family, school and community as agents of socialization
- Role of family in children’s developmental outcomes
- Diverse family structures, parenting styles and values
- Teachers’ and caregivers’ influences on children and families

**Course: Teaching in a Diverse Society**

Student Learning Outcomes:
- Critique the multiple societal impacts on young children’s social identity.
- Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.
Course: Teaching in a Diverse Society - Continued

Objectives:
• Compare the historical and current perspectives involving diversity and inclusion and their impacts on children’s identity development and learning.

Content and Topics:
• The highly diverse world in which children now live
• Personal histories and experiences; internalized privilege and oppression; impacts on our identities, our choices and our teaching with children and families

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.

Content and Topics:
• Application of developmentally, culturally, and linguistically appropriate practices
• Adaptations for children with diverse abilities, learning styles, and temperaments

History–Social Science – Learning Experience 2:

Course: Child Growth and Development

Student Learning Outcomes:
• Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.

Objectives:
• Examine and evaluate the importance of the early years.
• Identify and describe biological and environmental factors that influence children’s development from conception to adolescence across domains.

Content and Topics:
• Contemporary social issues that impact children’s development
• The role and influence of family and caregivers
• The role and influence cultural and societal impacts

Course: Child, Family and Community

Student Learning Outcomes:
• Analyze theories of socialization that address the interrelationship of child, family and community.
• Describe social issues, changes, and transitions that affect children, families, schools, and communities.
Course: Child, Family and Community - Continued

Student Learning Outcomes - Continued:
• Identify and evaluate community support services and agencies available to families and children.
• Analyze one’s own values, goals and sense of self as related to family history and life experiences, assessing how this impacts relationships with children and families.

Objectives:
• Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
• Compare and contrast diverse family structures, parenting styles, culture, tradition and values and their impact upon children and youth.
• Describe contemporary social issues and their effects on families and children.
• Identify appropriate community resources that support children and families including at risk populations.

Content and Topics:
• Major current and historical theoretical frameworks of socialization
• Interrelatedness of family, school and community as agents of socialization
• Role of family in children’s developmental outcomes
• Diverse family structures, parenting styles and values

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple impacts on young children’s social identity.
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.
• Evaluate the impact of personal experiences and social identity on teaching effectiveness.

Objectives:
• Compare the historical and current perspectives involving diversity and inclusion and their impacts on children’s identity development and learning.
• Explain the nature and processes of systemic and internalized privilege and oppression.
• Differentiate between various sources of diversity.

Content and Topics:
• The highly diverse world in which children now live
• Clarification of terms: Sex, gender, gender role, sexual orientation; racial, ethnic, cultural, national identity; nuclear family, blended family, single-parent family; trans-racial family, gay-lesbian family, extended family, adoptive family, foster family; etc.
• Identification of stereotypes and biased messages in the media and in the classroom and exploration of educational approaches that teach children how to challenge such messages and develop alternative behaviors
History–Social Science – Learning Experience 3:

Course: Child Growth and Development

Student Learning Outcomes:
• Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.
• Identify cultural, economic, political, historical contexts that affect children’s development.

Objectives:
• Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.

Content and Topics:
• Development (including but not limited to physical, social/emotional, cognitive, language, special needs, risk factors, and care and education at each level)
  o Play-years development

Course: Child, Family and Community

Student Learning Outcomes:
• Analyze one’s own values, goals and sense of self as related to family history and life experiences, assessing how this impacts relationships with children and families.

Objectives:
• Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.

Content and Topics:
• Interrelatedness of family, school and community as agents of socialization
• The influence of teachers’ and caregivers’ personal experience and family history on relationships with children and families

Course: Introduction to Curriculum

Student Learning Outcomes:
• Recognize developmentally appropriate teaching strategies and apply them in supervised settings for young children.

Objectives:
• Identify the influence of daily schedules and routines on curriculum and activities.

Content and Topics:
• Components of effective learning environments
• Content areas (math, science, literacy, social studies, creative arts)
• The development of the “whole child” (physical, cognitive, and social/emotional development, including socialization, self-regulation, self-help skills for all children)
Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Examine a variety of guidance and interaction strategies to increase children’s social competence and promote a caring classroom community.

Objectives:
• Identify children’s developmental processes and describe adaptations to curriculum and environments needed to support all children.
• Compare and contrast principles of positive guidance and interactions.

Content and Topics:
• Addressing the needs of the “whole child” (physical, cognitive, social-emotional)
• Positive guidance strategies

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple societal impacts on young children’s social identity.
• Evaluate the impact of personal experiences and social identity on teaching effectiveness.

Objectives:
• Evaluate inclusive classroom environments, materials and approaches for developmental, cultural, and linguistic appropriateness.
• Demonstrate strategies for helping children negotiate and resolve conflicts with a focus on using anti-bias approaches in the classroom.

Content and Topics:
• Issues of inequity and access as they relate to young children in a world of diversity
• How children think: pre-prejudice, impacts of silence, overt and covert social messages
• Clarification of terms: Sex, gender, gender role, sexual orientation; racial, ethnic, cultural, national identity; nuclear family, blended family, single-parent family; trans-racial family, gay-lesbian family, extended family, adoptive family, foster family; etc.
• Personal histories and experiences; internalized privilege and oppression; impacts on our identities, our choices and our teaching with children and families

Course: Practicum-Field Experience

Student Learning Outcomes:
• Apply a variety of effective approaches, strategies and techniques supporting positive relationships with children and adults.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.
• Model and facilitate appropriate problem solving, conflict resolution strategies, and social behavior.
Course: Practicum-Field Experience - Continued

Content and Topics:
- Application of developmentally, culturally, and linguistically appropriate practices
- Positive interactions with children and adults
- Adaptations for children with diverse abilities, learning styles, and temperaments
- Content Areas
  - Social Studies
- Integration of content areas across Curriculum
- California State Learning Standards and tools

History–Social Science – Learning Experience 4:

Course: Child Growth and Development

Student Learning Outcomes:
- Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.

Objectives:
- Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.
- Demonstrate knowledge of current research as it applies to child development.
- Examine and evaluate the role of family in facilitating children’s development.

Content and Topics:
- Major current and historical theoretical frameworks of child development
- Investigative research methods:
  - Analysis
  - Presentation of findings
- Development (including but not limited to physical, social/emotional, cognitive, language, special needs, risk factors, and care and education at each level)
  - Play-years development
- The role and influence of family and caregivers

Course: Child, Family and Community

Student Learning Outcomes:
- Analyze theories of socialization that address the interrelationship of child, family and community.
- Describe effective strategies that empower families and encourage family involvement in children’s development.

Objectives:
- Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
- Explain the effects of age, gender, diverse abilities, language and culture, racial identity and ethnicity, socioeconomic status and institutions on children and families.
- Explore one’s own family history and examine how it affects one’s relationships with children and families.
Course: Child, Family and Community - Continued

Content and Topics:
- Interrelatedness of family, school and community as agents of socialization
- Role of family in children’s developmental outcomes
- Diverse family structures, parenting styles and values
- Teachers’ and caregivers’ influences on children and families
- The influence of teachers’ and caregivers’ personal experience and family history on relationships with children and families

Course: Introduction to Curriculum

Student Learning Outcomes:
- Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
- Identify and evaluate teaching behaviors for research-based best practices.
- Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
- Developmental theory as it applies to curriculum development
- Consideration of cultural, linguistic, ethnic, economic, ability and gender diversity including the acquisition of English as a second language in planning for young children
- Use of current research
- Strategies for family involvement
- The development of the “whole child” (physical, cognitive, and social/emotional development, including socialization, self-regulation, self-help skills for all children)

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
- Examine a variety of guidance and interaction strategies to increase children’s social competence and promote a caring classroom community.

Objectives:
- Identify children’s developmental processes and describe adaptations to curriculum and environments needed to support all children.
- Compare and contrast principles of positive guidance and interactions.
- Describe the characteristics of effective relationships and interactions between early childhood professionals, children, families, and colleagues including the importance of collaboration.

Content and Topics:
- Current and historic models, influences, and approaches in the field of early childhood
- Addressing the needs of the “whole child” (physical, cognitive, social-emotional)
- Collaboration and partnerships with families, colleagues, and health care professionals
Course: Health, Safety and Nutrition

Student Learning Outcomes:
• Discuss the value of collaboration with families and the community.

Objectives:
• Compare and contrast various methods of collaboration with teachers and families to promote health and safety in settings for all children.

Content and Topics:
• Respecting the cultural, linguistic, and developmental differences of families, teachers and children
• Collaboration with families and health care professionals

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple societal impacts on young children’s social identity.
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.

Objectives:
• Compare the historical and current perspectives involving diversity and inclusion and their impacts on children’s identity development and learning.

Content and Topics:
• The highly diverse world in which children now live
• Personal histories and experiences; internalized privilege and oppression; impacts on our identities, our choices and our teaching with children and families

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.
• Evaluate the effectiveness of early childhood curriculum, classrooms, teaching strategies and how teachers involve families in their children’s development and learning to improve teaching practices for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Model and facilitate appropriate problem solving, conflict resolution strategies, and social behavior.

Content and Topics:
• Application of developmentally, culturally, and linguistically appropriate practices
• Positive interactions with children and adults
• Typical teaching and non-teaching activities in early childhood settings
• California State Learning Standards and tools
• Family involvement in early childhood programs
History–Social Science – Learning Experience 5:

Course: Child Growth and Development

Student Learning Outcomes:
• Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.

Objectives:
• Demonstrate knowledge of current research as it applies to child development.
• Examine and evaluate the importance of the early years.

Content and Topics:
• Major current and historical theoretical frameworks of child development
• Investigative research methods:
  o Analysis

Course: Introduction to Curriculum

Student Learning Outcomes:
• Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
• Demonstrate how curriculum and environment can be designed and adapted for children’s unique and individual ages, stages, and needs.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Standards from legislation and accrediting groups
• Use of current research

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Interpret best and promising teaching and care practices as defined within the field of early care and education’s history, range of delivery systems, program types and philosophies and ethical standards.

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
• Current and historic models, influences, and approaches in the field of early childhood
• Delivery systems (nonprofit, profit, publicly funded, alternative payment/voucher)
• Attention to developmental needs of children of different ages (infant/toddler, preschool, school-age)
• Quality indicators of programs (e.g., accreditation, assessment tools)
Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.
• Critically assess one’s own teaching experiences to guide and inform practice.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.
• Analyze student teaching experiences to inform and guide future teaching and collaborative practices.

Content and Topics:
• Professional development skills
• Content Areas:
  o Social Studies
• California State Learning Standards and tools

History–Social Science – Learning Experience 6:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify cultural, economic, political, historical contexts that affect children’s development.

Objectives:
• Examine and evaluate the importance of the early years.
• Examine and evaluate the role of family in facilitating children’s development.

Content and Topics:
• Contemporary social issues that impact children’s development
• The role and influence of family and caregivers
• The role and influence cultural and societal impacts

Course: Child, Family and Community

Student Learning Outcomes:
• Analyze theories of socialization that address the interrelationship of child, family and community.
• Describe social issues, changes, and transitions that affect children, families, schools, and communities.
• Analyze one’s own values, goals and sense of self as related to family history and life experiences, assessing how this impacts relationships with children and families.

Objectives:
• Identify how the child as develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
• Explain the effects of age, gender, diverse abilities, language and culture, racial identity and ethnicity, socioeconomic status and institutions on children and families.
Course: Child, Family and Community - Continued

Objectives - Continued:
• Explore one’s own family history and examine how it affects one’s relationships with children and families.

Content and Topics:
• Interrelatedness of family, school and community as agents of socialization
• Role of family in children’s developmental outcomes
• The influence of teachers’ and caregivers’ personal experience and family history on relationships with children and families
• The role of group childcare and early schooling on socialization
• Contemporary social issues and their effect on children and families

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Develop one’s teaching philosophy and professional goals.
• Examine a variety of guidance and interaction strategies to increase children’s social competence and promote a caring classroom community.

Objectives:
• Identify the historical roots, learning theories and professional pathways in early childhood education including ethical and professional standards.
• Describe the characteristics of effective relationships and interactions between early childhood professionals, children, families, and colleagues including the importance of collaboration.

Content and Topics:
• The importance of developmentally, culturally, linguistically appropriate practice
• Importance of positive teacher-child relationships and interactions
• Developing philosophy of Early Childhood

Course: Health, Safety and Nutrition

Student Learning Outcomes:
• Assess strategies to maximize the mental and physical health of children and adults in accordance with culturally, linguistic and developmentally sound practice.
• Discuss the value of collaboration with families and the community.

Objectives:
• Compare and contrast various methods of collaboration with teachers and families to promote health and safety in settings for all children.

Content and Topics:
• Respecting the cultural, linguistic, and developmental differences of families, teachers and children
• Collaboration with families and health care professionals
Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple societal impacts on young children’s social identity.
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.

Objectives:
• Compare the historical and current perspectives involving diversity and inclusion and their impacts on children’s identity development and learning.
• Differentiate between various sources of diversity.
• Demonstrate strategies for helping children negotiate and resolve conflicts with a focus on using anti-bias approaches in the classroom.

Content and Topics:
• The highly diverse world in which children now live
• How children think: pre-prejudice, impacts of silence, overt and covert social messages
• Personal histories and experiences; internalized privilege and oppression; impacts on our identities, our choices and our teaching with children and families

Course: Practicum-Field Experience

Student Learning Outcomes:
• Critically assess one’s own teaching experiences to guide and inform practice.

Objectives:
• Analyze student teaching experiences to inform and guide future teaching and collaborative practices.

Content and Topics:
• Application of developmentally, culturally, and linguistically appropriate practices
• Integration of content areas across Curriculum
• California State Learning Standards and tools
• Family involvement in early childhood programs

History–Social Science – Learning Experience 7:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify cultural, economic, political, historical contexts that affect children’s development.

Objectives:
• Examine and evaluate the role of family in facilitating children’s development.

Content and Topics:
• The role and influence of family and caregivers
• The role and influence cultural and societal impacts
Course: Child, Family and Community

Student Learning Outcomes:
- Analyze theories of socialization that address the interrelationship of child, family and community.
- Describe effective strategies that empower families and encourage family involvement in children’s development.

Objectives:
- Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
- Explain the effects of age, gender, diverse abilities, language and culture, racial identity and ethnicity, socioeconomic status and institutions on children and families.
- Describe contemporary social issues and their effects on families and children.

Content and Topics:
- Interrelatedness of family, school and community as agents of socialization
- Role of family in children’s developmental outcomes
- Diverse family structures, parenting styles and values

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
- Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families.

Objectives:
- Describe the characteristics of effective relationships and interactions between early childhood professionals, children, families, and colleagues including the importance of collaboration.

Content and Topics:
- Characteristics and roles of an effective teacher in an early childhood setting
- Collaboration and partnerships with families, colleagues, and health care professionals

Course: Observation and Assessment

Student Learning Outcomes:
- Identify the role of partnerships with families and other professionals in utilizing interpretations of observational data to inform teaching practices.

Objectives:
- Describe the effect of social context, child’s state of health and well-being, primary language, ability, and environment on assessment processes.

Content and Topics:
- The value of collaboration with families and professionals
Course: Health, Safety and Nutrition

Student Learning Outcomes:
• Discuss the value of collaboration with families and the community.

Objectives:
• Compare and contrast various methods of collaboration with teachers and families to promote health and safety in settings for all children.

Content and Topics:
• Respecting the cultural, linguistic, and developmental differences of families, teachers and children
• Collaboration with families and health care professionals

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple societal impacts on young children’s social identity.
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.

Objectives:
• Differentiate between various sources of diversity.
• Demonstrate strategies for helping children negotiate and resolve conflicts with a focus on using anti-bias approaches in the classroom.
• Investigate and develop strategies to create partnerships with families on issues of bias and injustice through building mutual, collaborative relationships.

Content and Topics:
• The highly diverse world in which children now live
• Environments and curriculums that respectively reflect children’s cultures and experiences and that expose children to the larger communities in which they live
• Personal histories and experiences; internalized privilege and oppression; impacts on our identities, our choices and our teaching with children and families

Course: Practicum-Field Experience

Student Learning Outcomes:
• Evaluate the effectiveness of early childhood curriculum, classrooms, teaching strategies and how teachers involve families in their children’s development and learning to improve teaching practices for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.

Content and Topics:
• Application of developmentally, culturally, and linguistically appropriate practices
• Integration of content areas across Curriculum
• California State Learning Standards and tools
• Family involvement in early childhood programs
History–Social Science – Learning Experience 8:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify cultural, economic, political, historical contexts that affect children’s development.

Objectives:
• Demonstrate knowledge of current research as it applies to child development.
• Examine and evaluate the role of family in facilitating children’s development.
• Identify and describe biological and environmental factors that influence children’s development from conception to adolescence across domains.

Content and Topics:
• Contemporary social issues that impact children’s development
• The role and influence of family and caregivers
• The role and influence cultural and societal impacts

Course: Child, Family and Community

Student Learning Outcomes:
• Analyze theories of socialization that address the interrelationship of child, family and community.
• Describe effective strategies that empower families and encourage family involvement in children’s development.
• Identify and evaluate community support services and agencies available to families and children.
• Analyze one’s own values, goals and sense of self as related to family history and life experiences, assessing how this impacts relationships with children and families.

Objectives:
• Identify how the child as develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
• Compare and contrast diverse family structures, parenting styles, culture, tradition and values and their impact upon children and youth.
• Explain the effects of age, gender, diverse abilities, language and culture, racial identity and ethnicity, socioeconomic status and institutions on children and families.
• Analyze diverse practices, patterns and styles of communication, and demonstrate positive communication strategies that support all families.
• Identify appropriate community resources that support children and families including at risk populations.
• Explore one’s own family history and examine how it affects one’s relationships with children and families.

Content and Topics:
• Role of family in children’s developmental outcomes
• Diverse family structures, parenting styles and values
Course: Child, Family and Community - Continued

Content and Topics - Continued:
• Community agencies, referral systems, procedures and availability of specialized services and support for families and children including at-risk populations
• The influence of teachers’ and caregivers’ personal experience and family history on relationships with children and families
• Contemporary social issues and their effect on children and families
• Stereotypes and assumptions and their effect upon the family, the culture and the professional community

Course: Introduction to Curriculum

Student Learning Outcomes:
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
• Demonstrate how curriculum and environment can be designed and adapted for children’s unique and individual ages, stages, and needs.

Content and Topics:
• Consideration of cultural, linguistic, ethnic, economic, ability and gender diversity including the acquisition of English as a second language in planning for young children

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families.
• Examine a variety of guidance and interaction strategies to increase children’s social competence and promote a caring classroom community.

Objectives:
• Describe the characteristics of effective relationships and interactions between early childhood professionals, children, families, and colleagues including the importance of collaboration.

Content and Topics:
• The importance of developmentally, culturally, linguistically appropriate practice

Course: Observation and Assessment

Student Learning Outcomes:
• Identify the role of partnerships with families and other professionals in utilizing interpretations of observational data to inform teaching practices.
Course: Observation and Assessment - Continued

Objectives:
• Describe the effect of social context, child’s state of health and well-being, primary language, ability, and environment on assessment processes.

Content and Topics:
• The value of collaboration with families and professionals

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple societal impacts on young children’s social identity.
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.
• Critically assess the components of linguistically and culturally relevant, inclusive, age-appropriate, anti-bias approaches in promoting optimum learning and development.
• Evaluate the impact of personal experiences and social identity on teaching effectiveness.

Objectives:
• Compare the historical and current perspectives involving diversity and inclusion and their impacts on children’s identity development and learning.
• Investigate and develop strategies to create partnerships with families on issues of bias and injustice through building mutual, collaborative relationships.

Content and Topics:
• The highly diverse world in which children now live
• Differences between individual prejudice and the systems within a society that maintain unequal access based on race, gender, economic class, ability, sexual orientation, religious beliefs, family groupings, culture, language and all “isms”
• Effects of dominant culture holiday curriculums; Examination of culturally and class embedded traditions of diverse groups
• Teachers and families: teacher responsibility to assess power dynamics; and commitment to co-creation of anti-bias approaches

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Assume teaching and non-teaching responsibilities and demonstrate developmentally appropriate practices in an early childhood classroom.

Content and Topics:
• Adaptations for children with diverse abilities, learning styles, and temperaments
• Typical teaching and non-teaching activities in early childhood settings
• California State Learning Standards and tools
History–Social Science – Learning Experience 9:

Course: Child Growth and Development

Student Learning Outcomes:
- Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.
- Apply developmental theory to child observations, surveys, and/or interviews using investigative research methodologies.

Objectives:
- Demonstrate knowledge of current research as it applies to child development.
- Demonstrate objective techniques and skills when observing, interviewing, describing and evaluating behavior in children of all ages.
- Examine and evaluate the importance of the early years.

Content and Topics:
- Major current and historical theoretical frameworks of child development
- Investigative research methods:
  - Observation
  - Analysis

Course: Introduction to Curriculum

Student Learning Outcomes:
- Use the ongoing cycle of curriculum development to plan, implement, and evaluate early childhood activities and environments.

Objectives:
- Observe and document children at play and propose appropriate activities and possibilities for expanding children's learning in a variety of curriculum areas.
- Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
- Observation and assessment strategies as they apply to curriculum planning and evaluation
- Innovative and best practices in teaching
- Use of current research
- The continuing cycle of observation, assessment, curriculum planning, documentation

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
- Analyze the relationship between observation, planning, implementation and assessment in developing effective teaching strategies and positive learning and development.

Objectives:
- Demonstrate basic observational skills.
- Describe the relationship of observation, planning, implementation, and assessment in effective programming.
Course: Principles and Practices of Teaching Young Children - Continued

Content and Topics:
• The importance of developmentally, culturally, linguistically appropriate practice
• Essentials of program planning and the interrelationship of planning, observation, and assessment

Course: Observation and Assessment

Student Learning Outcomes:
• Compare the purpose, value and use of formal and informal observation and assessment strategies.

Objectives:
• Use observation tools to identify quality in play-based environment, curriculum, and care routines, and to detect trends and anomalies in individuals and groups.
• Demonstrate and apply knowledge of developmental domains to interpret observations.

Content and Topics:
• Differentiation between subjective and objective data collection and recording
• Appropriate methods of child observation, documentation, portfolio collection, and record keeping
• Observation as part of the on-going process of curriculum and planning that support all children

Course: Practicum-Field Experience

Student Learning Outcomes:
• Evaluate the effectiveness of early childhood curriculum, classrooms, teaching strategies and how teachers involve families in their children’s development and learning to improve teaching practices for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.

Content and Topics:
• Ongoing Curriculum Development Cycle:
  o Observation
• Integration of content areas across Curriculum
• Environment as a teaching and learning tool
• California State Learning Standards and tools
History–Social Science – Learning Experience 10:

Course: Child, Family and Community

Student Learning Outcomes:
• Describe effective strategies that empower families and encourage family involvement in children’s development.

Objectives:
• Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.

Content and Topics:
• Interrelatedness of family, school and community as agents of socialization
• The influence of teachers’ and caregivers’ personal experience and family history on relationships with children and families
• The role of group childcare and early schooling on socialization

Course: Introduction to Curriculum

Student Learning Outcomes:
• Recognize developmentally appropriate teaching strategies and apply them in supervised settings with young children.
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
• Identify and evaluate teaching behaviors for research-based best practices.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Standards from legislation and accrediting groups
• Planning for diverse learning styles, motivations, interests, and abilities
• Innovative and best practices in teaching
• Use of current research

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Interpret best and promising teaching and care practices as defined within the field of early care and education’s history, range of delivery systems, program types and philosophies and ethical standards.

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.
Course: Principles and Practices of Teaching Young Children - Continued

Content and Topics:
• Current and historic models, influences, and approaches in the field of early childhood
• Delivery systems (nonprofit, profit, publicly funded, alternative payment/voucher)

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.
• Evaluate the impact of personal experiences and social identity on teaching effectiveness.

Objectives:
• Evaluate inclusive classroom environments, materials and approaches for developmental, cultural, and linguistic appropriateness.

Content and Topics:
• The highly diverse world in which children now live
• Differences between individual prejudice and the systems within a society that maintain unequal access based on race, gender, economic class, ability, sexual orientation, religious beliefs, family groupings, culture, language and all “isms”
• Culturally and developmentally appropriate classrooms: curriculum, environment; human relationships
• Effects of dominant culture holiday curriculums; Examination of culturally and class embedded traditions of diverse groups
• The teacher as model: self knowledge; recognition and respect for differences; responsive behaviors; acknowledgement and struggle with bias; change agent for and with children and families
• Teachers and families: teacher responsibility to assess power dynamics; and commitment to co-creation of anti-bias approaches

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.
• Evaluate the effectiveness of early childhood curriculum, classrooms, teaching strategies and how teachers involve families in their children’s development and learning to improve teaching practices for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Model and facilitate appropriate problem solving, conflict resolution strategies, and social behavior.

Content and Topics:
• Content Areas:
  o Social Studies
• California State Learning Standards and tools
History–Social Science – Learning Experience 11:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify and compare major theoretical frameworks related to the study of human development.

Objectives:
• Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.

Content and Topics:
• Major current and historical theoretical frameworks of child development

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
• Content Areas
  a. Language
  b. Literacy
  c. Math
  d. Science
  e. Social Studies
  f. Visual and performing arts
• Integration of content areas across Curriculum

History–Social Science – Learning Experience 12:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify and compare major theoretical frameworks related to the study of human development.

Objectives:
• Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.
Course: Child Growth and Development - Continued

Content and Topics:
• Major current and historical theoretical frameworks of child development

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
• Content Areas
  a. Language
  b. Literacy
  c. Math
  d. Science
  e. Social Studies
  f. Visual and performing arts
• Integration of content areas across Curriculum
Science Domain

Science – Learning Experience 1:

Course: Child, Family and Community

Student Learning Outcomes:
• Analyze theories of socialization that address the interrelationship of child, family and community.

Objectives:
• Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.

Content and Topics:
• Major current and historical theoretical frameworks of socialization
• Interrelatedness of family, school and community as agents of socialization
• Role of family in children’s developmental outcomes
• Diverse family structures, parenting styles and values

Course: Introduction to Curriculum

Student Learning Outcomes:
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
• Demonstrate how curriculum and environment can be designed and adapted for children’s unique and individual ages, stages, and needs.

Content and Topics:
• Planning for diverse learning styles, motivations, interests, and abilities
• Use of current research
• Content areas (math, science, literacy, social studies, creative arts)

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Develop one’s teaching philosophy and professional goals.

Objectives:
• Identify components of a play-based curriculum which is developmentally, culturally and linguistically appropriate and supports the development of all young children.

Content and Topics:
• The importance of developmentally, culturally, linguistically appropriate practice
• The influence of environment on behavior and learning (environment as third teacher)
Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Critique the multiple societal impacts on young children’s social identity.
• Evaluate the impact of personal experiences and social identity on teaching effectiveness.

Objectives:
• Evaluate inclusive classroom environments, materials and approaches for developmental, cultural, and linguistic appropriateness.

Content and Topics:
• The highly diverse world in which children now live
• Environments and curriculums that respectively reflect children’s cultures and experiences and that expose children to the larger communities in which they live

Course: Practicum-Field Experience

Student Learning Outcomes:
• Critically assess one’s own teaching experiences to guide and inform practice.

Objectives:
• Analyze student teaching experiences to inform and guide future teaching and collaborative practices.

Content and Topics:
• Application of developmentally, culturally, and linguistically appropriate practices
• Content Areas:
  o Science
• California State Learning Standards and tools

Science – Learning Experience 2:

Course: Child Growth and Development

Student Learning Outcomes:
• Apply developmental theory to child observations, surveys, and/or interviews using investigative research methodologies.

Objectives:
• Demonstrate objective techniques and skills when observing, interviewing, describing and evaluating behavior in children of all ages.

Content and Topics:
• Investigative research methods: Observation
• Development (including but not limited to physical, social/emotional, cognitive, language, special needs, risk factors, and care and education at each level):
  o Play-years development
Course: Introduction to Curriculum

Student Learning Outcomes:
• Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
• Observe and document children at play and propose appropriate activities and possibilities for expanding children’s learning in a variety of curriculum areas.
• Identify ways in which the environment functions as an essential component of curriculum.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Standards from legislation and accrediting groups
• The effect of environment on behavior

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Examine the value of play as a vehicle for developing skills, knowledge, dispositions, and strengthening relationships among young children.

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
• Play as a vehicle for development and learning
• The influence of environment on behavior and learning (environment as third teacher)

Course: Observation and Assessment

Student Learning Outcomes:
• Compare the purpose, value and use of formal and informal observation and assessment strategies.

Objectives:
• Demonstrate and apply knowledge of developmental domains to interpret observations.

Content and Topics:
• Appropriate methods of child observation, documentation, portfolio collection, and record keeping

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.
Course: Practicum-Field Experience - Continued

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.

Content and Topics:
• Content Areas:
  o Science
• California State Learning Standards and tools

Science – Learning Experience 3:

Course: Child Growth and Development

Student Learning Outcomes:
• Differentiate characteristics of typical and atypical development.

Objectives:
• Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.
• Examine and evaluate the importance of the early years.

Content and Topics:
• Development (including but not limited to physical, social/emotional, cognitive, language, special needs, risk factors, and care and education at each level).
  o Play-years development

Course: Introduction to Curriculum

Student Learning Outcomes:
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
• Identify and evaluate teaching behaviors for research-based best practices.

Content and Topics:
• Standards from legislation and accrediting groups
• Use of current research
• Content areas (math, science, literacy, social studies, creative arts)

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Interpret best and promising teaching and care practices as defined within the field of early care and education’s history, range of delivery systems, program types and philosophies and ethical standards.
Course: Principles and Practices of Teaching Young Children - Continued

Objectives:
- Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
- Characteristics and roles of an effective teacher in an early childhood setting

Course: Practicum-Field Experience

Student Learning Outcomes:
- Critically assess one's own teaching experiences to guide and inform practice.

Objectives:
- Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
- Analyze student teaching experiences to inform and guide future teaching and collaborative practices.

Content and Topics:
- Application of developmentally, culturally, and linguistically appropriate practices
- Content Areas:
  - Science
- California State Learning Standards and tools

Science – Learning Experience 4:

Course: Introduction to Curriculum

Student Learning Outcomes:
- Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
- Observe and document children at play and propose appropriate activities and possibilities for expanding children's learning in a variety of curriculum areas.

Content and Topics:
- Standards from legislation and accrediting groups
- Innovative and best practices in teaching

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
- Interpret best and promising teaching and care practices as defined within the field of early care and education's history, range of delivery systems, program types and philosophies and ethical standards.
**Course: Principles and Practices of Teaching Young Children - Continued**

Objectives:
- Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.
- Identify children’s developmental processes and describe adaptations to curriculum and environments needed to support all children.
- Demonstrate basic observational skills.

Content and Topics:
- The importance of developmentally, culturally, linguistically appropriate practice
- Applying developmentally-appropriate practices to normative and atypical development

**Course: Teaching in a Diverse Society**

Student Learning Outcomes:
- Critically assess the components of linguistically and culturally relevant, inclusive, age-appropriate, anti-bias approaches in promoting optimum learning and development.

Objectives:
- Evaluate inclusive classroom environments, materials and approaches for developmental, cultural, and linguistic appropriateness.

Content and Topics:
- Culturally and developmentally appropriate classrooms: curriculum, environment; human relationships

**Course: Practicum-Field Experience**

Student Learning Outcomes:
- Critically assess one’s own teaching experiences to guide and inform practice.

Objectives:
- Present and evaluate a variety of developmentally, culturally and linguistically appropriate play-based learning experiences.

Content and Topics:
- Application of developmentally, culturally, and linguistically appropriate practices
- Adaptations for children with diverse abilities, learning styles, and temperaments
- Content Areas:
  - Science

**Science – Learning Experience 5:**

**Course: Child Growth and Development**

Student Learning Outcomes:
- Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.
Course: Child Growth and Development - Continued

Objectives:
• Demonstrate knowledge of current research as it applies to child development.
• Examine and evaluate the importance of the early years.

Content and Topics:
• Major current and historical theoretical frameworks of child development
• Investigative research methods:
  o Analysis

Course: Introduction to Curriculum

Student Learning Outcomes:
• Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
• Demonstrate how curriculum and environment can be designed and adapted for children’s unique and individual ages, stages, and needs.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Standards from legislation and accrediting groups
• Use of current research

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Interpret best and promising teaching and care practices as defined within the field of early care and education’s history, range of delivery systems, program types and philosophies and ethical standards.

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
• Current and historic models, influences, and approaches in the field of early childhood
• Delivery systems (nonprofit, profit, publicly funded, alternative payment/voucher)
• Attention to developmental needs of children of different ages (infant/toddler, preschool, school-age)
• Quality indicators of programs (e.g., accreditation, assessment tools)

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.
Objectives:
- Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
- Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
- Content Areas:
  - Social Studies
- California State Learning Standards and tools

Course: Practicum-Field Experience - Continued

Science – Learning Experience 6:

Course: Child Growth and Development

Student Learning Outcomes:
- Describe major developmental milestones for children from conception through adolescence in the areas of physical, psychosocial, cognitive, and language development.

Objectives:
- Demonstrate knowledge of current research as it applies to child development.
- Examine and evaluate the importance of the early years.

Content and Topics:
- Major current and historical theoretical frameworks of child development
- Investigative research methods:
  - Interviews
  - Surveys
  - Observation
  - Documentation
  - Analysis
  - Presentation of findings
  - Ethics, bias, and validity of research
- Development (including but not limited to physical, social/emotional, cognitive, language, special needs, risk factors, and care and education at each level);
  - Play-years development.

Course: Introduction to Curriculum

Student Learning Outcomes:
- Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
- Identify and evaluate teaching behaviors for research-based best practices.
- Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.
Course: Introduction to Curriculum - Continued

Content and Topics:
• Developmental theory as it applies to curriculum development
• Innovative and best practices in teaching
• Use of current research

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Examine the value of play as a vehicle for developing skills, knowledge, dispositions, and strengthening relationships among young children.
• Analyze the relationship between observation, planning, implementation and assessment in developing effective teaching strategies and positive learning and development.

Objectives:
• Identify components of a play-based curriculum which is developmentally, culturally and linguistically appropriate and supports the development of all young children.
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
• Addressing the needs of the “whole child” (physical, cognitive, social-emotional)
• Play as a vehicle for development and learning
• The influence of environment on behavior and learning (environment as third teacher)

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
• Integration of content areas across Curriculum
• California State Learning Standards and tools

Science – Learning Experience 7:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify cultural, economic, political, historical contexts affect children’s development.
• Differentiate characteristics of typical and atypical development.
Course: Child Growth and Development - Continued

Objectives:
• Examine and evaluate the importance of the early years.
• Examine and evaluate the role of family in facilitating children's development.
• Identify and describe biological and environmental factors that influence children’s development from conception to adolescence across domains.

Content and Topics:
• Investigative research methods:
  o Ethics, bias, and validity of research
• The role and influence of family and caregivers
• The role and influence cultural and societal impacts

Course: Child, Family and Community

Student Learning Outcomes:
• Analyze theories of socialization that address the interrelationship of child, family and community.
• Analyze one’s own values, goals and sense of self as related to family history and life experiences, assessing how this impacts relationships with children and families.

Objectives:
• Identify how the child develops within a system and is influenced by numerous factors of socialization including the role of the family, childcare, schooling and the community.
• Compare and contrast diverse family structures, parenting styles, culture, tradition and values and their impact upon children and youth.

Content and Topics:
• Interrelatedness of family, school and community as agents of socialization
• Role of family in children’s developmental outcomes
• Diverse family structures, parenting styles and values
• The influence of teachers’ and caregivers’ personal experience and family history on relationships with children and families

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families.

Objectives:
• Identify components of a play-based curriculum which is developmentally, culturally and linguistically appropriate and supports the development of all young children.

Content and Topics:
• The importance of developmentally, culturally, linguistically appropriate practice
Course: Teaching in a Diverse Society

Student Learning Outcomes:

- Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.
- Critically assess the components of linguistically and culturally relevant, inclusive, age-appropriate, anti-bias approaches in promoting optimum learning and development.

Objectives:

- Differentiate between various sources of diversity.
- Identify and explore the overlapping influences of cultural identity and various “isms” as they relate to children, families, and early childhood settings.
- Evaluate inclusive classroom environments, materials and approaches for developmental, cultural, and linguistic appropriateness.

Content and Topics:

- The highly diverse world in which children now live
- Issues of inequity and access as they relate to young children in a world of diversity
- Culturally and developmentally appropriate classrooms: curriculum, environment; human relationships

Course: Practicum-Field Experience

Student Learning Outcomes:

- Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:

- Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
- Present and evaluate a variety of developmentally, culturally and linguistically appropriate play-based learning experiences.

Content and Topics:

- Application of developmentally, culturally, and linguistically appropriate practices
- Adaptations for children with diverse abilities, learning styles, and temperaments
- California State Learning Standards and tools

Science – Learning Experience 8:

Course: Child, Family and Community

Student Learning Outcomes:

- Describe effective strategies that empower families and encourage family involvement in children’s development.

Objectives:

- Analyze diverse practices, patterns and styles of communication, and demonstrate positive communication strategies that support all families.
- Identify appropriate community resources that support children and families including at risk populations.
Course: Child, Family and Community - Continued

Content and Topics:
• Teachers’ and caregivers’ influences on children and families
• Community agencies, referral systems, procedures and availability of specialized services and support for families and children including at-risk populations

Course: Introduction to Curriculum

Student Learning Outcomes:
• Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
• Observe and document children at play and propose appropriate activities and possibilities for expanding children's learning in a variety of curriculum areas.

Content and Topics:
• Innovative and best practices in teaching
• Use of current research
• Strategies for family involvement

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Examine the value of play as a vehicle for developing skills, knowledge, dispositions, and strengthening relationships among young children.

Objectives:
• Identify components of a play-based curriculum which is developmentally, culturally and linguistically appropriate and supports the development of all young children.
• Describe the characteristics of effective relationships and interactions between early childhood professionals, children, families, and colleagues including the importance of collaboration.

Content and Topics:
• Play as a vehicle for development and learning
• Characteristics and roles of an effective teacher in an early childhood setting

Course: Teaching in a Diverse Society

Student Learning Outcomes:
• Analyze various aspects of children’s experience as members of families targeted by social bias considering the significant role of education in reinforcing or contradicting such experiences.

Objectives:
• Investigate and develop strategies to create partnerships with families on issues of bias and injustice through building mutual, collaborative relationships.

Content and Topics:
• Anti-bias approaches to all curriculum arenas, materials, activities, goals, assessment
• Environments and curriculums that respectively reflect children’s cultures and experiences and that expose children to the larger communities in which they live
Course: Practicum-Field Experience

Student Learning Outcomes:
• Evaluate the effectiveness of early childhood curriculum, classrooms, teaching strategies and how teachers involve families in their children’s development and learning to improve teaching practices for all children.

Objectives:
• Present and evaluate a variety of developmentally, culturally and linguistically appropriate play-based learning experiences.
• Use professional written and verbal communication skills.

Content and Topics:
• California State Learning Standards and tools
• Family involvement in early childhood programs

Science – Learning Experience 9:

Course: Introduction to Curriculum

Student Learning Outcomes:
• Recognize developmentally appropriate teaching strategies and apply them in supervised settings for young children.
• Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
• Identify and evaluate teaching behaviors for research-based best practices.
• Identify ways in which the environment functions as an essential component of curriculum.
• Demonstrate how curriculum and environment can be designed and adapted for children’s unique and individual ages, stages, and needs.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Developmental theory as it applies to curriculum development
• Observation and assessment strategies as they apply to curriculum planning and evaluation
• Effective use of learning centers and integrated curriculum
• Content areas (math, science, literacy, social studies, creative arts)
• The development of the “whole child” (physical, cognitive, and social/emotional development, including socialization, self-regulation, self-help skills for all children)

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families.
• Examine a variety of guidance and interaction strategies to increase children’s social competence and promote a caring classroom community.
Course: Principles and Practices of Teaching Young Children - Continued

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.
• Identify children’s developmental processes and describe adaptations to curriculum and environments needed to support all children.

Content and Topics:
• Play as a vehicle for development and learning
• Characteristics and roles of an effective teacher in an early childhood setting
• Importance of positive teacher-child relationships and interactions
• The influence of environment on behavior and learning (environment as third teacher)

Course: Observation and Assessment

Student Learning Outcomes:
• Compare the purpose, value and use of formal and informal observation and assessment strategies.

Objectives:
• Use observation tools to identify quality in play-based environment, curriculum, and care routines, and to detect trends and anomalies in individuals and groups.
• Demonstrate and apply knowledge of developmental domains to interpret observations.

Content and Topics:
• National and State standards for learning and assessment (e.g., NAEYC’s position statement on assessment)
• Utilization of observation and assessment data to create appropriate curricula and environments
• Observation as part of the on-going process of curriculum and planning that support all children

Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Analyze classroom space and daily routines in terms of their effect on the behavior and interactions of children and teachers.
• Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
• Content Area:
  o Science
• Environment as a teaching and learning tool
• California State Learning Standards and tools
Science – Learning Experience 10:

Course: Child, Family and Community

Student Learning Outcomes:
• Identify and evaluate community support services and agencies available to families and children.

Objectives:
• Identify appropriate community resources that support children and families including at risk populations.

Content and Topics:
• Community agencies, referral systems, procedures and availability of specialized services and support for families and children including at-risk populations

Course: Introduction to Curriculum

Student Learning Outcomes:
• Recognize developmentally appropriate teaching strategies and apply them in supervised settings for young children.
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
• Demonstrate ability to select safe and appropriate materials and equipment.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Effective use of learning centers and integrated curriculum
• Content areas (math, science, literacy, social studies, creative arts)
• The development of the “whole child” (physical, cognitive, and social/emotional development, including socialization, self-regulation, self-help skills for all children)
• The Role of the ECE teacher

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families.

Objectives:
• Identify components of a play-based curriculum which is developmentally, culturally and linguistically appropriate and supports the development of all young children.

Content and Topics:
• The importance of developmentally, culturally, linguistically appropriate practice
• The influence of environment on behavior and learning (environment as third teacher)
• Quality indicators of programs (e.g., accreditation, assessment tools)
Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Integrate content areas and opportunities for development across the curriculum.
• Present and evaluate a variety of developmentally, culturally and linguistically appropriate play-based learning experiences.

Content and Topics:
• Application of developmentally, culturally, and linguistically appropriate practices
• Typical teaching and non-teaching activities in early childhood settings
• California State Learning Standards and tools

Science – Learning Experience 11:

Course: Introduction to Curriculum

Student Learning Outcomes:
• Recognize developmentally appropriate teaching strategies and apply them in supervised settings for young children.
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.

Objectives:
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Innovative and best practices in teaching
• Effective use of learning centers and integrated curriculum
• The development of the “whole child” (physical, cognitive, and social/emotional development, including socialization, self-regulation, self-help skills for all children)

Course: Principles and Practices of Teaching Young Children

Student Learning Outcomes:
• Assess early childhood settings, curriculum, and teaching strategies utilizing indicators of quality early childhood practice that support all children including those with diverse characteristics and their families.

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
• Addressing the needs of the “whole child” in the (physical, cognitive, social-emotional)
• Characteristics and roles of an effective teacher in an early childhood setting
Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
• Content Areas:
  o Literacy
  o Math
  o Science
• Integration of content areas across Curriculum
• California State Learning Standards and tools

Science – Learning Experience 12:

Course: Child Growth and Development

Student Learning Outcomes:
• Identify and compare major theoretical frameworks related to the study of human development.

Objectives:
• Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.

Content and Topics:
• Major current and historical theoretical frameworks of child development

Course: Health, Safety and Nutrition

Student Learning Outcomes:
• Analyze the nutritional needs of children at various ages and evaluate the relationship between healthy development and nutrition.

Objectives:
• Differentiate the nutritional needs of various ages of children and plan economical and nutritional meals and snacks based on the individual needs of children.

Content and Topics:
• Promoting good health including responsibilities of teacher as role model of best health, safety and nutrition practices
Course: Practicum-Field Experience

Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.

Objectives:
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.
• Integrate content areas and opportunities for development across the curriculum.

Content and Topics:
• Content Areas
  a. Language
  b. Literacy
  c. Math
  d. Science
  e. Social Studies
  f. Visual and performing arts
• Integration of content areas across Curriculum
Overview of the Alignment Document Learning Experience

Course: Introduction to Curriculum
Student Learning Outcomes:
• Demonstrate an understanding of the many aspects of the teachers’ role in early childhood programs.
• Identify play-based curriculum models and approaches, standards for early learning, and indicators of quality.

Objectives:
• Identify and evaluate teaching behaviors for research-based best practices.
• Identify ways in which development in all domains and learning in all content areas can be integrated across the curriculum.

Content and Topics:
• Standards from legislation and accrediting groups
• Use of current research
• Content areas (math, science, literacy, social studies, creative arts)
• The development of the “whole child” (physical, cognitive, and social/emotional development, including socialization, self-regulation, self-help skills for all children)
• The Role of the ECE teacher

Course: Principles and Practices of Teaching Young Children
Student Learning Outcomes:
• Interpret best and promising teaching and care practices as defined within the field of early care and education’s history, range of delivery systems, program types and philosophies and ethical standards.

Objectives:
• Investigate various foundations and theories in the field of early childhood education as a basis for forming a personal philosophy of teaching and developing professional goals.

Content and Topics:
• Addressing the needs of the “whole child” (physical, cognitive, social-emotional)
• Quality indicators of programs (e.g., accreditation, assessment tools)

Course: Practicum-Field Experience
Student Learning Outcomes:
• Integrate understanding of children’s development and needs to create and maintain healthy, safe, respectful, supportive and challenging learning environments for all children.
• Critically assess one’s own teaching experiences to guide and inform practice.
Course: Practicum-Field Experience - Continued

Objectives:
• Assume teaching and non-teaching responsibilities and demonstrate developmentally appropriate practices in an early childhood classroom.
• Incorporate current research and understanding of developmental theories into the selection of learning materials and experiences for young children.

Content and Topics:
• Professional development skills
• Integration of content areas across Curriculum
• Environment as a teaching and learning tool
• State qualifications
• California State Learning Standards and tools
## Appendix B

### History–Social Science

#### Self and Society

1.0 Culture and Diversity

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Exhibit developing cultural, ethnic, and racial identity and understand relevant language and cultural practices. Display curiosity about diversity in human characteristics and practices, but prefer those of their own group.</td>
<td>1.1 Manifest stronger cultural, ethnic, and racial identity and greater familiarity with relevant language, traditions, and other practices. Show more interest in human diversity, but strongly favor characteristics of their own group.</td>
</tr>
</tbody>
</table>

2.0 Relationships

| 2.1 Interact comfortably with many peers and adults; actively contribute to creating and maintaining relationships with a few significant adults and peers. | 2.1 Understand the mutual responsibilities of relationships; take initiative in developing relationships that are mutual, cooperative, and exclusive. |

3.0 Social Roles and Occupations

| 3.1 Play familiar adult social roles and occupations (such as parent, teacher, and doctor) consistent with their developing knowledge of these roles. | 3.1 Exhibit more sophisticated understanding of a broader variety of adult roles and occupations, but uncertain how work relates to income. |

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## Becoming a Preschool Community Member (Civics)

### 1.0 Skills for Democratic Participation

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify as members of a group, participate willingly in group activities, and begin to understand and accept responsibility as group members, although assistance is required in coordinating personal interests with those of others.</td>
<td>1.1 Become involved as responsible participants in group activities, with growing understanding of the importance of considering others' opinions, group decision making, and respect for majority rules and the views of group members who disagree with the majority.</td>
</tr>
</tbody>
</table>

### 2.0 Responsible Conduct

| 2.1 Strive to cooperate with group expectations to maintain adult approval and get along with others. Self-control is inconsistent, however, especially when children are frustrated or upset. | 2.1 Exhibit responsible conduct more reliably as children develop self-esteem (and adult approval) from being responsible group members. May also manage others’ behavior to ensure that others also fit in with group expectations. |

### 3.0 Fairness and Respect for Other People

| 3.1 Respond to the feelings and needs of others with simple forms of assistance, sharing, and turn-taking. Understand the importance of rules that protect fairness and maintain order. | 3.1 Pay attention to others' feelings, more likely to provide assistance, and try to coordinate personal desires with those of other children in mutually satisfactory ways. Actively support rules that protect fairness to others. |

### 4.0 Conflict Resolution

| 4.1 Can use simple bargaining strategies and seek adult assistance when in conflict with other children or adults, although frustration, distress, or aggression also occurs. | 4.1 More capable of negotiating, compromising, and finding cooperative means of resolving conflict with peers or adults, although verbal aggression may also result. |
# Sense of Time

## (History)

### 1.0 Understanding Past Events

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> Recall past experiences easily and enjoy hearing stories about the past, but require adult help to determine when past events occurred in relation to each other and to connect them with current experience.</td>
<td><strong>1.1</strong> Show improving ability to relate past events to other past events and current experiences, although adult assistance continues to be important.</td>
</tr>
</tbody>
</table>

### 2.0 Anticipating and Planning Future Events

| **2.1** Anticipate events in familiar situations in the near future, with adult assistance. | **2.1** Distinguish when future events will happen, plan for them, and make choices (with adult assistance) that anticipate future needs. |

### 3.0 Personal History

| **3.1** Proudly display developing skills to attract adult attention and share simple accounts about recent experiences. | **3.1** Compare current abilities with skills at a younger age and share more detailed autobiographical stories about recent experiences. |

### 4.0 Historical Changes in People and the World

| **4.1** Easily distinguish older family members from younger ones (and other people) and events in the recent past from those that happened “long ago,” although do not readily sequence historical events on a timeline. | **4.1** Develop an interest in family history (e.g., when family members were children) as well as events of “long ago,” and begin to understand when those events occurred in relation to each other. |

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## Sense of Place
**(Geography and Ecology)**

### 1.0 Navigating Familiar Locations

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify the characteristics of familiar locations such as home and school, describe objects and activities associated with each, recognize the routes between them, and begin using simple directional language (with various degrees of accuracy).</td>
<td>1.1 Comprehend larger familiar locations, such as the characteristics of their community and region (including hills and streams, weather, common activities) and the distances between familiar locations (such as between home and school), and compare their home community with those of others.</td>
</tr>
</tbody>
</table>

### 2.0 Caring for the Natural World

| 2.1 Show an interest in nature (including animals, plants, and weather) especially as children have direct experience with them. Begin to understand human interactions with the environment (such as pollution in a lake or stream) and the importance of taking care of plants and animals. | 2.1 Show an interest in a wider range of natural phenomena, including those not directly experienced (such as snow for a child living in Southern California), and are more concerned about caring for the natural world and the positive and negative impacts of people on the natural world (e.g., recycling, putting trash in trash cans). |

### 3.0 Understanding the Physical World Through Drawings and Maps

| 3.1 Can use drawings, globes, and maps to refer to the physical world, although often unclear on the use of map symbols. | 3.1 Create their own drawings, maps, and models; are more skilled at using globes, maps, and map symbols; and use maps for basic problem solving (such as locating objects) with adult guidance. |

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## Marketplace (Economics)

### 1.0 Exchange

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> Understand ownership, limited supply, what stores do, give-and-take, and payment of money to sellers. Show interest in money and its function, but still figuring out the relative value of coins.</td>
<td><strong>1.1</strong> Understand more complex economic concepts (e.g., bartering; more money is needed for things of greater value; if more people want something, more will be sold).</td>
</tr>
</tbody>
</table>

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### Science

#### Scientific Inquiry

**1.0 Observation and Investigation**

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Demonstrate curiosity and raise simple questions about objects and events in their environment.</td>
</tr>
<tr>
<td>1.2 Observe objects and events in the environment and describe them.</td>
</tr>
<tr>
<td>1.3 Begin to identify and use, with adult support, some observation and measurement tools.</td>
</tr>
<tr>
<td>1.4 Compare and contrast objects and events and begin to describe similarities and differences.</td>
</tr>
<tr>
<td><strong>At around 60 months of age</strong></td>
</tr>
<tr>
<td>1.1 Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.</td>
</tr>
<tr>
<td>1.2 Observe objects and events in the environment and describe them in greater detail.</td>
</tr>
<tr>
<td>1.3 Identify and use a greater variety of observation and measurement tools. May spontaneously use an appropriate tool, though may still need adult support.</td>
</tr>
<tr>
<td>1.4 Compare and contrast objects and events and describe similarities and differences in greater detail.</td>
</tr>
<tr>
<td>1.5 Demonstrate an increased ability to make predictions and check them (e.g., may make more complex predictions, offer ways to test predictions, and discuss why predictions were correct or incorrect).</td>
</tr>
<tr>
<td>1.6 Demonstrate an increased ability to make inferences and form generalizations based on evidence.</td>
</tr>
</tbody>
</table>

1. Other related scientific processes, such as classifying, ordering, and measuring, are addressed in the foundations for mathematics.

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### 2.0 Documentation and Communication

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Record observations or findings in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos.</td>
<td>2.1 Record information more regularly and in greater detail in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, photos, or by tallying and graphing information.</td>
</tr>
<tr>
<td>2.2 Share findings and explanations, which may be correct or incorrect, with or without adult prompting.</td>
<td>2.2 Share findings and explanations, which may be correct or incorrect, more spontaneously and with greater detail.</td>
</tr>
</tbody>
</table>

### Physical Sciences

#### 1.0 Properties and Characteristics of Nonliving Objects and Materials

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Observe, investigate, and identify the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
<td>1.1 Demonstrate increased ability to observe, investigate, and describe in greater detail the characteristics and physical properties of objects and of solid and nonsolid materials (size, weight, shape, color, texture, and sound).</td>
</tr>
</tbody>
</table>

#### 2.0 Changes in Nonliving Objects and Materials

| 2.1 Demonstrate awareness that objects and materials can change; explore and describe changes in objects and materials (rearrangement of parts; change in color, shape, texture, temperature). | 2.1 Demonstrate an increased awareness that objects and materials can change in various ways. Explore and describe in greater detail changes in objects and materials (rearrangement of parts; change in color, shape, texture, form, and temperature). |
### 2.0 Changes in Nonliving Objects and Materials *(continued)*

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Observe and describe the motion of objects (in terms of speed, direction, the ways things move), and explore the effect of own actions (e.g., pushing, pulling, rolling, dropping) on making objects move.</td>
<td>2.2 Demonstrate an increased ability to observe and describe in greater detail the motion of objects (in terms of speed, direction, the ways things move), and to explore the effect of own actions on the motion of objects, including changes in speed and direction.</td>
</tr>
</tbody>
</table>

### Life Sciences

#### 1.0 Properties and Characteristics of Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.</td>
<td>1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.</td>
</tr>
<tr>
<td>1.2 Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.(^2)</td>
<td>1.2 Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.</td>
</tr>
<tr>
<td>1.3 Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.</td>
<td>1.3 Recognize that living things have habitats in different environments suited to their unique needs.</td>
</tr>
<tr>
<td>1.4 Indicate knowledge of the difference between animate objects (animals, people) and inanimate objects. For example, expect animate objects to initiate movement and to have different insides than inanimate objects.</td>
<td>1.4 Indicate knowledge of the difference between animate and inanimate objects, providing greater detail, and recognize that only animals and plants undergo biological processes such as growth, illness, healing, and dying.</td>
</tr>
</tbody>
</table>

\(^2\) The knowledge of body parts is also addressed in the *California Preschool Foundations (Volume 2)* for health. In science, it also includes the knowledge of body processes. Knowledge of body parts is extended to those of humans and other animals.

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## 2.0 Changes in Living Things

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Observe and explore growth and changes in humans, animals, and plants and demonstrate an understanding that living things change over time in size and in other capacities as they grow.</td>
<td>2.1 Observe and explore growth in humans, animals, and plants and demonstrate an increased understanding that living things change as they grow and go through transformations related to the life cycle (for example, from a caterpillar to butterfly).</td>
</tr>
<tr>
<td>2.2 Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.</td>
<td>2.2 Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).</td>
</tr>
</tbody>
</table>

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# Earth Sciences

## 1.0 Properties and Characteristics of Earth Materials and Objects

<table>
<thead>
<tr>
<th>At around 48 months of age</th>
<th>At around 60 months of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
<td>1.1 Demonstrate increased ability to investigate and compare characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.</td>
</tr>
</tbody>
</table>

## 2.0 Changes in the Earth

| 2.1 Observe and describe natural objects in the sky (sun, moon, stars, clouds) and how they appear to move and change. | 2.1 Demonstrate an increased ability to observe and describe natural objects in the sky and to notice patterns of movement and apparent changes in the sun and the moon. |
| 2.2 Notice and describe changes in weather. | 2.2 Demonstrate an increased ability to observe, describe, and discuss changes in weather. |
| 2.3 Begin to notice the effects of weather and seasonal changes on their own lives and on plants and animals. | 2.3 Demonstrate an increased ability to notice and describe the effects of weather and seasonal changes on their own lives and on plants and animals. |
| 2.4 Develop awareness of the importance of caring for and respecting the environment and participate in activities related to its care. | 2.4 Demonstrate an increased awareness and the ability to discuss in simple terms how to care for the environment, and participate in activities related to its care. |
Appendix C

Related Links and Resources

CDE/ECE Faculty Initiative Project
http://www.wested.org/facultyinitiative

WestEd
http://www.wested.org

Instructional Guides from the Faculty Initiative Project

http://www.wested.org/facultyinitiative/pelguide.html

Instructional Guide for the California Preschool Learning Foundations, Volume 1

Instructional Guide for the California Preschool Curriculum Framework, Volume 1
http://www.wested.org/facultyinitiative/PCF/index.html

Instructional Guide for the California Preschool Learning Foundations, Volume 2
http://www.wested.org/facultyinitiative/PLFv2/index.html

Instructional Guide for the California Preschool Curriculum Framework, Volume 2

Instructional Guide for the California Preschool Learning Foundations, Volume 3
Will be made available on the Faculty Initiative Project Web site in Summer 2014

Publications


http://www.cde.ca.gov/sp/cd/re/documents/psframeworkvol2.pdf

Appendix C – Related Links and Resources

Publications – Continued


http://www.cde.ca.gov/sp/cd/re/documents/psfoundationsvol2.pdf


http://www.cde.ca.gov/sp/cd/re/documents/psenglearnersed2.pdf

Resources for the CA Preschool Curriculum Framework, Volume 1 (PCF, V1)

California Preschool Curriculum Framework, Volume 1 Order Information

Corrected Page 303 of the California Early Learning and Development System

Resources for the CA Preschool Curriculum Framework, Volume 2 (PCF, V2)

California Preschool Curriculum Framework, Volume 2 Order Information

Resources for the CA Preschool Curriculum Framework, Volume 3 (PCF, V3)

California Preschool Curriculum Framework, Volume 3 Order Information

Resources for the CA Preschool Learning Foundations, Volume 1 (PLF, V1)

California Preschool Learning Foundations, Volume 1 Order Form
http://www.cccoe.k12.ca.us/edsvcs/PDFs/cpin/2011/PLFV1OrderForm.pdf

California Preschool Learning Foundations FAQ
http://www.cde.ca.gov/sp/cd/re/psfoundationsfaq.asp

Resources for the CA Preschool Learning Foundations, Volume 2 (PLF, V2)

California Preschool Learning Foundations, Volume 2 Order Information

Resources for the CA Preschool Learning Foundations, Volume 3 (PLF, V3)

California Preschool Learning Foundations FAQ
http://www.cde.ca.gov/sp/cd/re/psfoundationsfaq.asp
Resources for the **CA Preschool Learning Foundations, Volume 3 (PLF, V3)**

*California Preschool Learning Foundations, Volume 3 Order Information*

*California Preschool Learning Foundations FAQ*
http://www.cde.ca.gov/sp/cd/re/psfoundationsfaq.asp

Appendix B: The Foundations – An Overview of the **Alignment of the California Preschool Learning Foundations with Key Early Education Resources**
http://www.cde.ca.gov/sp/cd/re/documents/preschoolfoundationsvol3.pdf#appendixb

**Resources for the Preschool English Learners (PEL) Resource Guide**

A World Full of Language: Supporting Preschool English Learners (DVD)


*Preschool English Learners: Principles and Practices to Promote Language, Literacy, and Learning, Spanish Edition Ordering Information*

**Resources for Desired Results Development Profiles**

Desired Results access Project
http://www.draccess.org

Desired Results System
http://www.cde.ca.gov/sp/cd/ci/desiredresults.asp

Desired Results Training and Technical Assistance Project
http://www.desiredresults.us/trainings.htm

DRDPtech CLOUD
http://desiredresults.us/form_drdp_tech.htm

Desired Results Developmental Profile – School Readiness (DRDP-SR)
http://drdpsr.org

Desired Results Developmental Profile – School Readiness Online
http://www.drdpsronline.org
Resources for the Desired Results Development Profiles – Continued

Getting to Know You Through Observation
http://www.wested.org/resources/getting-to-know-you-through-observation/

Watching My Child Grow
http://www.desiredresults.us/for_families.htm

Early Childhood Education Resources

The Alignment of the California Preschool Learning Foundations with Key Early Education Resources

Best Practices for Dual-Language Learners

California Association for the Education of Young Children (CAEYC)
http://www.caeyc.org

California Community College Early Childhood Educators (CCCECE)
https://sites.google.com/site/ccceceducators/

California Collaborative on the Social & Emotional Foundations for Early Learning (CA CSEFEL)
http://cainclusivechildcare.org/camap/cacsefel.html

California Comprehensive Early Learning Plan

California Department of Education (CDE)
http://www.cde.ca.gov

California Early Childhood Mentor Program
http://www.ecementor.org

California MAP to Inclusion & Belonging: Making Access Possible
http://www.cainclusivechildcare.org/camap

California Preschool Instructional Network (CPIN)
http://www.cpin.us

California State Advisory Council on Early Learning and Care
http://www.cde.ca.gov/sp/cd/ce/
Early Childhood Education Resources – Continued

CDE Transitional Kindergarten Implementation Guide

Center for the Study of Child Care Employment
http://www.irle.berkeley.edu/cscce

Center on the Social and Emotional Foundations for Early Learning
http://www.vanderbilt.edu/csefel

Child Development Training Consortium (CDTC)
http://www.childdevelopment.org/cs/cdtc/print/htdocs/home.htm

Commission on Teacher Credentialing (CTC)
http://www.ctc.ca.gov

CPIN Dual Language Learners Web site
http://www.cpin.us/dll/

Curriculum Alignment Project’s (CAP) Lower Division 8
http://www.childdevelopment.org/cs/cdtc/print/htdocs/services_cap.htm

Early Childhood Curriculum, Assessment, and Program Evaluation: Building an Effective, Accountable System in Programs for Children Birth through Age 8 Position Statement with Expanded Resources by the National Association for the Education of Young Children (NAEYC)
http://www.naeyc.org/positionstatements

Early Education and Support Division (formerly Child Development Division)
http://www.cde.ca.gov/re/di/or/cdd.asp

First 5 California
http://www.ccfc.ca.gov

NAEYC Resources for Early Childhood Educators as Learners

National Center for Research on Early Childhood Education
http://www.ncrece.org

Pathways to Cultural Competence Project Program Guide
California Early Childhood Educator Competencies Resources

California Early Childhood Educator Competencies

California Early Childhood Educator Competencies Mapping Tool
http://www.childdevelopment.org/cs/cip/print/htdocs/mt/home.htm

CompSAT – The Portfolio Protocol
http://www.ececompsat.org/portfolio-protocol.html

Local Quality Improvement Efforts and Outcomes Descriptive Study

Race to the Top Early Learning Challenge
http://www.cde.ca.gov/sp/cd/rt/rttelcapproach.asp

Infant/Toddler Resources

Infant/Toddler Curriculum Framework
http://www.cde.ca.gov/sp/cd/re/itframework.asp

Infant/Toddler Learning & Development Foundations
http://www.education.ca.gov/sp/cd/re/itfoundations.asp

Infant/Toddler Learning & Development Program Guidelines

Program for Infant/Toddler Care (PITC)
http://www.pitc.org

ZERO TO THREE
http://www.zerotothree.org