



Science:

Exploring Relationships of the Science Domain to the Physical Development Domain and the Health Domain



**Science Domain:
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



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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:

- 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 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.

Information Delivery



Slide 2-3

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.



Active Learning

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.



Slide 4-6

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.

Science Domain	Physical Development Domain and Health Domain
<i>Physical Sciences</i> Substrand: Properties and Characteristics of Nonliving Objects and Materials	<i>Physical Development</i> Substrand: Fundamental Movement Skills
<i>Physical Sciences</i> Substrand: Changes in Nonliving Objects and Materials	<i>Physical Development</i> Substrand: Perceptual-Motor Skills and Movement Concepts
<i>Life Sciences</i> Substrand: Properties and Characteristics of Living Things	<i>Physical Development</i> Substrand: Active Physical Play
<i>Life Sciences</i> Substrand: Changes in Living Things	<i>Health</i> Substrand: Health Habits
<i>Earth Sciences</i> Substrand: Properties and Characteristics of Earth Materials and Objects	<i>Physical Development</i> Substrand: Fundamental Movement Skills
<i>Earth Sciences</i> Substrand: Changes in the Earth	<i>Health</i> Substrands: Safety and Nutrition



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.

Online Options

If the class has document-sharing capability, ask students to take turns posting their visual representations. Then students could ask questions of each group through a chat room or other online-discussion method.

Reflection



Slide 7-8

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

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Demonstrate curiosity and raise simple questions about objects and events in their environment.	1.1 Demonstrate curiosity and an increased ability to raise questions about objects and events in their environment.
1.2 Observe ¹ objects and events in the environment and describe them.	1.2 Observe objects and events in the environment and describe them in greater detail.
1.3 Begin to identify and use, with adult support, some observation and measurement tools.	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.
1.4 Compare and contrast objects and events and begin to describe similarities and differences.	1.4 Compare and contrast objects and events and describe similarities and differences in greater detail.
1.5 Make predictions and check them, with adult support, through concrete experiences.	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).
1.6 Make inferences and form generalizations based on evidence.	1.6 Demonstrate an increased ability to make inferences and form generalizations based on evidence.

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

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

Physical Sciences

1.0 Properties and Characteristics of Nonliving Objects and Materials

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
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).	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).

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).
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2.0 Changes in Nonliving Objects and Materials (*continued*)

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
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.	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.

Life Sciences

1.0 Properties and Characteristics of Living Things

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.	1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.
1.2 Begin to indicate knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals. ²	1.2 Indicate greater knowledge of body parts and processes (e.g., eating, sleeping, breathing, walking) in humans and other animals.
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.	1.3 Recognize that living things have habitats in different environments suited to their unique needs.
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.	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.

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

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
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.	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).
2.2 Recognize that animals and plants require care and begin to associate feeding and watering with the growth of humans, animals, and plants.	2.2 Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).

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Earth Sciences

1.0 Properties and Characteristics of Earth Materials and Objects

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Investigate characteristics (size, weight, shape, color, texture) of earth materials such as sand, rocks, soil, water, and air.	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.

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.

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Physical Development

Fundamental Movement Skills

1.0 Balance

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Maintain balance while holding still; sometimes may need assistance.	1.1 Show increasing balance and control when holding still.
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.	1.2 Show increasing balance control while moving in different directions and when transitioning from one movement or position to another.

2.0 Locomotor Skills

2.1 Walk with balance, not always stable, oppositional arm movements still developing, and relatively wide base of support (space between feet).	2.1 Walk with balance, oppositional arm movements, and relatively narrow base of support (space between feet).
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.	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.
2.3 Jump for height (up or down) and for distance with beginning competence.	2.3 Jump for height (up or down) and for distance with increasing competence. Uses arm swing to aid forward jump.
2.4 Begin to demonstrate a variety of locomotor skills, such as galloping, sliding, hopping, and leaping.	2.4 Demonstrate increasing ability and body coordination in a variety of locomotor skills, such as galloping, sliding, hopping, and leaping.

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3.0 Manipulative Skills

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
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.	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.
3.2 Begin to show fine motor manipulative skills using hands and arms such as in-hand manipulation, writing, cutting, and dressing.	3.2 Show increasing fine motor manipulative skills using hands and arms such as in-hand manipulation, writing, cutting, and dressing.

Perceptual–Motor Skills and Movement Concepts

1.0 Body Awareness

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Demonstrate knowledge of the names of body parts.	1.1 Demonstrate knowledge of an increasing number of body parts.

2.0 Spatial Awareness

2.1 Use own body as reference point when locating or relating to other people or objects in space.	2.1 Use own body, general space, and other people's space when locating or relating to other people or objects in space.
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3.0 Directional Awareness

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").	3.1 Begin to understand and distinguish between the sides of the body.
3.2 Move forward and backward or up and down easily.	3.2 Can change directions quickly and accurately.

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3.0 Directional Awareness (Continued)

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

Active Physical Play

1.0 Active Participation

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Initiate or engage in simple physical activities for a short to moderate period of time.	1.1 Initiate more complex physical activities for a sustained period of time.

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.
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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.
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Health

Health Habits

1.0 Basic Hygiene

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Demonstrate knowledge of some steps in the handwashing routine.	1.1 Demonstrate knowledge of more steps in the handwashing routine.
1.2 Practice health habits that prevent infectious diseases and infestations (such as lice) when appropriate, with adult support, instruction, and modeling.	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.

2.0 Oral Health

2.1 Demonstrate knowledge of some steps of the routine for brushing teeth, with adult supervision and instruction.	2.1 Demonstrate knowledge of more steps of the routine for brushing and when toothbrushing should be done, with less adult supervision.
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3.0 Knowledge of Wellness

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

4.0 Sun Safety

4.1 Begin to practice sun-safe actions, with adult support and guidance.	4.1 Practice sun-safe actions with decreasing adult support and guidance.
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Safety

1.0 Injury Prevention

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

Nutrition

1.0 Nutrition Knowledge

<i>At around 48 months of age</i>	<i>At around 60 months of age</i>
1.1 Identify different kinds of foods.	1.1 Identify a larger variety of foods and may know some of the related food groups.

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.
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