



**California Education and the Environment Initiative**

The EEI Curriculum cohesively integrates science and engineering practices (SEPs), content (disciplinary core ideas/DCIs), and crosscutting concepts (CCs) within its lesson procedures. This preliminary analysis intentionally teases apart the individual SEPs, DCIs, and CCs as a means of correlating the EEI unit with specific performance expectations; however, the EEI lessons weave these components back together to provide three-dimensional learning for students.

**Grades 3 and 4**

**3.3.c./3.3.d. - Living Things in Changing Environments**

“Living Things in Changing Environments”, through a reader about the Sweetwater Marsh National Wildlife Refuge, introduces students to the effects that changes to habitats and ecosystems can have on the survival of particular organisms. Students discover that when a habitat undergoes change, the organisms are affected in different ways, which may be neutral, beneficial, or detrimental, but ultimately can influence their survival. By looking at a power plant that was built to provide electricity to Southern California, students think about how habitat changes can affect the types and distribution of organisms in an area. The unit also gives them an opportunity, to learn about California’s scrubland, chaparral, and mixed forest habitats. They find out how certain human activities have influenced the natural systems in these areas. Finally, they read about habitat restoration and brainstorm ideas about how human activities, such as this, can help certain organisms survive.



**Next Generation Science Standards\* Correlation with the California Education and the Environment Initiative (EEI) Curriculum**

The EEI Curriculum is a great choice for transitioning to NGSS and contributes toward achievement of the performance expectations for the disciplinary core ideas reflected in the Summary Chart below: 3-LS4 Biological Evolution: Unity and Diversity and 4-ESS3 Earth and Human Activity. Each EEI unit highlights a small number of performance expectations, science and engineering practices, disciplinary core ideas, and crosscutting concepts. Therefore, the EEI units contribute to students’ overall achievement of the performance expectations by the end of a school year, where they will have had multiple opportunities to engage in all appropriate science and engineering practices, disciplinary core ideas, and crosscutting concepts. While EEI was designed to teach the 1998 California science standards to mastery, it reflects the real world interconnections in science and already incorporates many of the paradigm shifts reflected in the NGSS. To learn more about how EEI supports NGSS, visit <http://californiaeei.org/NGSSGuides/>.



**Correlation Chart Key**

SEP (Science and Engineering Practices)
DCI (Disciplinary Core Ideas)
CC (Crosscutting Concepts)

	Next Generation Science Standards					
	3-LS4			4-ESS3		
<b>California Connection</b>		✓	✓		✓	
<b>Lesson 1</b> - Investigate salt marsh ecosystems to explore environmental change and its effects on different species	✓	✓	✓	✓	✓	
<b>Lesson 2</b> - Predict how environmental changes will affect populations of salt marsh species.	✓	✓	✓	✓	✓	
<b>Lesson 3</b> - Examine and act out how species respond to environmental changes.	✓	✓	✓	✓		
<b>Lesson 4</b> - Analyze how natural and human-caused environmental changes alter ecosystems.	✓	✓	✓	✓	✓	
<b>Lesson 5</b> - Assess habitat restoration efforts in Sweetwater Marsh to restore plants and animals.		✓	✓	✓	✓	
<b>Traditional Unit Assessment</b>	✓	✓	✓	✓	✓	
<b>Alternative Unit Assessment</b>	✓	✓	✓	✓	✓	
	SEP	DCI	CC	SEP	DCI	CC

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<b>Disciplinary Core Ideas Supported by this EEI Unit</b>					
<b>3-LS4 Biological Evolution: Unity and Diversity</b> <b>4-ESS3 Earth and Human Activity</b>					
<b>Performance Expectations</b>			<b>Suggestions for Using the EEI Unit to Support NGSS</b>		
<b>3-LS4-3:</b> Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.			Use this unit to have students study a variety of organisms in different ecosystems and determine that when a habitat undergoes change, the organisms are affected in neutral, beneficial, or detrimental ways which will influence their survival.		
<b>3-LS4-4:</b> Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.			Use this unit to have students examine the changes made to the Sweetwater Marsh and how those changes have affected the types and distribution of organisms in the area, and study how human activities have helped certain organisms survive.		
<b>4-ESS3-1:</b> Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.			Use this unit to have students determine how a power plant built to meet the human need for energy has affected the plants, animals, and habitats near the Sweetwater Marsh in Southern California.		
<b>Science and Engineering Practices (SEPs)</b>	<b>Suggestions for Using EEI to Support SEPs</b>	<b>Disciplinary Core Ideas (DCIs)</b>	<b>Suggestions for Using EEI to Support DCIs</b>	<b>Crosscutting Concepts (CCs)</b>	<b>Suggestions for Using EEI to Support CCs</b>
<b>Engaging in Argument from Evidence (3-LS4-3, 3-LS4-4)</b>	Use the unit to have students gather evidence that when habitats change, many organisms will be affected in a variety of ways (Lessons 1, 2, and 3). Have students make a case that large-scale changes to an ecosystems, such as a catastrophic fire, can result in the disappearance of certain organisms, as evidenced by the case of the Ponderosa pine trees in the San Bernardino Mountains (Lesson 4).	<b>LS4.C: Adaptation:</b> For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)	Use the unit to have students discover that certain plants and animals are able to adapt to environmental changes, such as eelgrass growing in water that has become more shallow because of increased mud and green sea turtles becoming more abundant when water becomes warmer (Lessons 1 and 2). Have students consider how, as a result of their adaptations, some animals and plants react well to change, and some do not, such as non-native plants thriving in areas where wildfires are more frequent (Lesson 3).	<b>Cause and Effect (3-LS4-3)</b>  <b>Systems and System Models (3-LS4-4)</b>	Use the unit to have students examine the cause and effect relationships throughout this unit as they study how organisms react to human and naturally caused alterations to ecosystems. Have students explore how some organisms can be affected neutrally, negatively, or beneficially, depending on the type and severity of change (Lessons 1, 3, 4 and 5).  Use the unit to have students consider how scientists use systems models to study the changes to natural systems that result from human activities, such as habitat alteration or construction of a power plant. Have them realize that scientists study the smaller systems that
<b>Obtaining, Evaluating, and Communicating Information (4-ESS3-1)</b>	Use the unit to have students read, discuss, and evaluate the effects both natural and human-caused changes have had on three different ecosystems (Lessons 1, 3, and 4) Have them write about ways in which humans are helping to restore the Sweetwater Marsh (Lesson 5).				

Science and Engineering Practices (SEPs)	Suggestions for Using EEI to Support SEPs	Disciplinary Core Ideas (DCIs)	Suggestions for Using EEI to Support DCIs	Crosscutting Concepts (CCs)	Suggestions for Using EEI to Support CCs
		<p><b>LS4.D:</b> Biodiversity and Humans: Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)</p> <p><b>ESS3.A:</b> Natural Resources: Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (4-ESS3-1)</p>	<p>Use the unit to have students examine multiple human-caused environmental changes (habitat loss, native plant removal) and how those changes affect the populations and health of organisms (Lesson 1, 2, and 3). Have them analyze some human caused changes to the environment, and determine that some of those changes can alter biodiversity (Lesson 4). Have students examine what changes humans can make to ecosystems that may help plants and animals to survive, such as habitat restoration (Lessons 1 and 5).</p> <p>Use the unit to have students examine the effects a power plant has had on the Sweetwater Marsh (Lessons 1, 2, and 5). Have them evaluate the impact on ecosystems from cutting down trees for fuel and agriculture, and consider how this has influenced those ecosystems through habitat loss, as well as resulting flash flooding and an increased frequency of wildfires (Lessons 3 and 4).</p>	<p><b>Influence of Science, Engineering and Technology on Society and the Natural World (4-ESS3-1)</b></p>	<p>they find within larger systems, for example determining the effects of dredging on an eelgrass population (Lessons 1 and 2). Have students analyze which organisms were helped or harmed as a result of changes to a chaparral ecosystem (Lesson 3). Have them discover that certain types of large-scale changes to ecosystems can significantly influence the survival of the plants and animals that inhabit them (Lesson 4).</p> <p>Use the unit to have students consider both the positive and detrimental effects that science and technology can have on ecosystems. Have them analyze the costs associated with human population growth and consider the effects on the natural world that can result from increased energy use, land use choices, and other changes that result from human activities (Lessons 1-5).</p>