



## 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.

### Grade 5

#### 4.2.a. - Plants: The Ultimate Energy Resource

“Plants: The Ultimate Energy Resource” engages students in the study of energy flow through ecosystems by starting with a story about agriculture in California. This unit helps students discover that plants derive their energy from the Sun and that plants are, in turn, the primary source of energy for living things. By participating in a food chain card game they discuss energy flow along a food chain and discuss that not all of a plant’s energy is available to an animal by which it is consumed. Students conduct an investigation and record data about their own activities and energy consumption over the course of one or more days, they then use this information by “following” the path back down the food chain to find the source(s) of the energy that keeps them going throughout a day. They end the unit by exploring the similarities between the survival needs of early California Indians and today’s California residents.



## 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 standards reflected in the Summary Chart below: 5-PS3 Energy and 5-LS2 Ecosystems: Interactions, Energy, and Dynamics. 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					
	5-PS3			5-LS2		
<b>California Connection</b>					✓	
<b>Lesson 1</b> – Explore how California’s agriculture meets our energy needs.	✓		✓	✓		
<b>Lesson 2</b> – Examine how plants, animals, and people use and obtain energy.	✓	✓	✓	✓	✓	✓
<b>Lesson 3</b> – pathways that fresh water flows from	✓	✓	✓	✓	✓	✓
<b>Lesson 4</b> – Trace the source of Energy for our daily activities.	✓	✓	✓	✓	✓	✓
<b>Lesson 5</b> –Examine the role of plants in providing energy for Californians throughout the ages.			✓		✓	✓
<b>Traditional Unit Assessment</b>	✓	✓	✓	✓	✓	✓
<b>Alternative Unit Assessment</b>		✓	✓		✓	✓
	SEP	DCI	CC	SEP	DCI	CC

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**EEI Unit 4.2.a. - Plants: The Ultimate Energy Resource**

Disciplinary Core Ideas Supported by this EEI Unit 5-PS3 Energy 5-LS2 Ecosystems: Interactions, Energy, and Dynamics					
Performance Expectations			Suggestions for Using the EEI Unit to Support NGSS		
<p><b>5-PS3-1:</b> Use models to describe that energy in animals’ food (used for repair, growth, motion and to obtain body warmth) was once energy from the sun.</p>			<p>Use the unit to help students realize that plants are the primary source of energy for living things, and that plants derive their energy from the Sun.</p>		
<p><b>5-LS2-1:</b> Develop a model using an example to describe the movement of matter among plants, animals, decomposers, and the environment</p>			<p>Use the unit to have students examine how energy is transferred between organisms, develop a model of this transfer, and use models of energy and matter movement, such as a food chain, to describe this phenomenon..</p>		
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>Developing and Using Models (5-PS3-1, 5-LS2-1)</b></p>	<p>Use this unit to have students examine how living things, including humans, must obtain energy by consuming plants and/or other organisms that get their energy from plants (Lessons 1 and 2). Have them develop and use multiple models through the food chain card game (Lesson 3). Have students create a model, based on charting their food intake, that demonstrates where their own energy comes from (Lesson 4).</p>	<p><b>PS3.D: Energy in Chemical Processes and Everyday Life:</b> The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1)</p> <p><b>LS1.C: Organization for Matter and Energy Flow in Organisms:</b> Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)</p>	<p>Use this unit to have students use different models to see how plants and algae use sunlight, water, and CO2 to produce food for themselves and for other organisms that feed upon them (Lessons 2, 3, and 4).</p> <p>Use this unit to have students explore how matter and energy flow through ecosystems through the study of various ecosystems (Lesson 2). Have them use a food chain game to study how matter and energy flow within an ecosystem, and how that energy originated from the Sun (Lessons 3 and 4).</p>	<p><b>Energy and Matter (5-PS3-1)</b></p> <p><b>Systems and system models (5-LS2-1)</b></p>	<p>Use this unit to have students analyze how energy from the Sun moves through different ecosystems in a variety of ways, as well as describing how energy moves between plants and animals, including humans (Lessons 1-5).</p> <p>Use this unit to have students examine energy flow through a natural system by studying different ecosystems (Lesson 2). Have them realize that a food chain is a model that represents the interactions of different components (for example plants and animals) within an ecosystem (Lesson 3). Have them create their own system model that represents how they obtain energy by tracking their own food intake (Lesson 4).</p>

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>LS2.A: Interdependent Relationships in Ecosystems:</b> The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)</p> <p><b>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</b> Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)</p>	<p>Use this unit to have students analyze the relationships among living things in a variety of ecosystems (Lesson 2). Help them discover, through a study of food chains, that energy for all living organisms comes from plants that obtain their energy from the Sun (Lesson 3). Have students investigate and discuss that humans obtain their energy through the ecosystem goods produced directly and indirectly by plants, such as milk and bread, and ecosystem services that are the basis of plant survival, such as the water cycle and decomposition (Lessons 3 and 4).</p> <p>Use this unit to have students determine how energy cycles through different ecosystems (Lesson 2). Have them analyze food chains, through an interactive game, to determine how matter and energy move through ecosystems (Lesson 3).</p>		