

California Education and the Environment Initiative

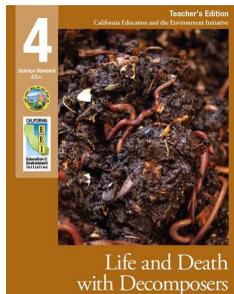
The EEI Curriculum cohesively integrates science and engineering practices (SEPs), content (disciplinary core ideas/DCIs), and crosscutting concepts (CCs) within its lesson procedures. This preliminary analysis intentionally teases apart the individual SEPs, DCIs, and CCs as a means of correlating the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



Grades 4 and 5

4.2.c. – Life and Death with Decomposers

“Life and Death with Decomposers” focuses on decomposers and their role in breaking down carbon-based organic matter, materials that come from living things. This unit helps students learn that decomposers are actually part of a larger system that works to cycle chemicals such as carbon, nitrogen, water, and oxygen through complete food webs. They set up a composting lab and make predictions about the decomposition process. Students then explore the importance of decomposers to human waste management systems. Life and Death with Decomposers also helps them discover the role that decomposers play in the health of topsoil and the whole agricultural system.



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: 5-LS2 Ecosystems: Interactions, Energy, and Dynamics, 5-ESS3 Earth and Human Activity, and 3-5 ETS1 Engineering Design. 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-LS2			5-ESS3			3-5-ETS1		
California Connection		✓			✓	✓			
Lesson 1 – Read about composting and take part in a composting demonstration using bananas and yeast.	✓	✓	✓		✓		✓		
Lesson 2 – Examine descriptions and photographs of decomposers and scavengers and compare characteristics.		✓							
Lesson 3 – Observe and discuss evidence of decomposition and the role of decomposers in ecosystems.	✓	✓	✓			✓			
Lesson 4 – Interpret a diagram showing a wastewater management system and answer questions.	✓		✓		✓	✓	✓	✓	
Lesson 5 – Investigate and describe why decomposers and humus are essential to agriculture.	✓	✓	✓		✓	✓	✓		
Lesson 6 – Discuss how composting can help communities manage waste.		✓			✓	✓	✓	✓	
Traditional Unit Assessment	✓	✓	✓		✓	✓	✓		
Alternative Unit Assessment	✓	✓	✓		✓	✓	✓	✓	
	SEP	DCI	CC	SEP	DCI	CC	SEP	DCI	CC

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Disciplinary Core Ideas Supported by this EEI Unit
5-LS2 Ecosystems: Interactions, Energy, and Dynamics
5-ESS3 Earth and Human Activity
3-5 ETS1 Engineering Design

Performance Expectations	Suggestions for Using the EEI Unit to Support NGSS
5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Use the unit to have students study how decomposers work to create compost, thereby reducing food waste, and how scavengers and decomposers work together to break down material into its simplest components.
5-ESS3-1: Obtain and combine information about ways individual communities use science to protect the Earth’s resources and environment.	Use the unit to have students explore composting and its positive effects on the environment, and how the human practices of food production and waste management depend on the processes of decomposition.
3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Use the unit to have students explore how society uses composting and wastewater treatment facilities as an alternative to land disposal of waste.

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>Developing and using models (5-LS2-1)</p> <p>Constructing explanations and designing solutions (3-5-ETS1-2)</p>	<p>Use the unit to have students develop and use models to represent the role of decomposers in a forest and in a coastal environment (Lesson 3). Students learn about wastewater management through the study of models (Lesson 4).</p> <p>Use the unit to expose students to solutions that help protect our environment, such as creating compost to reduce the amount of yard and food waste going to landfills and for beneficial use in agriculture, and treating human waste (Lessons 1,4,5,and 6). Challenge students to explore solutions other than those found in this unit, and then draw conclusions, based on evidence, as to how well other solutions would meet societal and environmental demands.</p>	<p>LS2.A: Interdependent Relationships in Ecosystems: 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</p>	<p>Use the unit to have students study in detail how decomposers (bacteria and fungi) work to break down plant and animal material into its simplest parts and about the relationship between decomposers and scavengers within ecosystems (Lessons 2 and 3). Have students explore how humans increase agricultural production by adding compost to soil (Lessons 1, 5 and 6).</p>	<p>Systems and system models (5-LS2-1, 5-ESS3-1)</p> <hr style="border-top: 1px dashed #000;"/> <p>Influence of engineering, technology, and science on society and the natural world (3-5-ETS1-2)</p>	<p>Use the unit to introduce students to the process of decomposition through the study of a forest and a coastal ecosystem (Lesson 3). Students evaluate the role of decomposers in waste management and in food production (Lessons 4 and 5).</p> <hr style="border-top: 1px dashed #000;"/> <p>Use the unit to have students study how humans are using science and technology, through the implementation of a large-scale green waste program, to reduce waste and water use in our communities (Lesson 1 and 6). Students engage in a study of water treatment facilities and learn about how humans use the science of decomposition to treat human waste and help keep our communities safe from disease (Lesson 4). Students are encouraged to leverage their knowledge of composting to help reduce the need for more landfills (Lesson 6).</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>Challenge students to explore solutions other than those found in this unit, and then draw conclusions, based on evidence, as to how well other solutions would meet societal and environmental demands.</p>	<p>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>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems: 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>ESS3.C: Human Impacts on Earth’s Systems: Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)</p>	<p>Use the unit to have students explore models in forest and coastal ecosystems of how matter cycles between plants, animals, microbes, soil, and water (Lesson 3). Have students consider the cycling of matter in a municipal wastewater management system (Lesson 4). Have them examine different types of soils and consider how decomposers contribute to nutrient-rich soils for agriculture (Lesson 5).</p> <p>Use the unit to have students analyze how decomposers impact individual homes, communities, and industry, and how the use of composting can reduce water use in agriculture and home gardens (Lesson 1). Students consider the benefit of decomposers as they review and discuss water treatment facilities (Lesson 4). Students analyze how composting can improve agriculture and reduce the need for landfills (Lessons 5 and 6).</p>		

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		<p>ETS1.B: Developing Possible Solutions: - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)</p> <p>- At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)</p>	<p>Use the unit to have students learn about environmental solutions presented in this unit (composting and wastewater treatment), and encourage students to investigate, discuss, and create original solutions to reduce human created wastes.</p>		