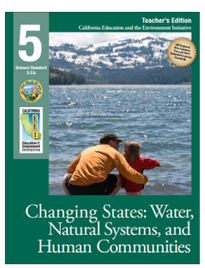
California Education and the Environment Initiative

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.

Fifth Grade and Middle School (Grade 6 in the Integrated Course Model)

5.3.b. – Changing States: Water, Natural Systems, and Human Communities

"Changing States: Water, Natural Systems, and Human Communities" provides students with the opportunity to explore two primary ways water moves through the water cycle, evaporation and condensation. Students examine salt farming on San Francisco Bay as a practical example of how evaporation can play an important role in the production of table salt, a resource they may use every day. They participate in experiments, discussions, and observe demonstrations, as they analyze the various processes involved in water moving through the water cycle. Through guided inquiry, they discover how wind, temperature, and humidity can affect rates of evaporation and transpiration. Students study the role of energy from the Sun and the force of gravity in driving the cycling of water through Earth's systems. Through observing water vapor's role in evaporation, condensation, and transpiration, students discover that matter is made of particles too small to be seen. Students also learn, from a model of the evaporation processes that occur during salt farming, that the mixing of two or more substances does not always result in a new substance. Finally, through a classroom demonstration and discussion they learn how different phases of matter, in this case water, can play a role in the functioning of natural systems and human communities. of the effects of natural ecosystem changes and human activities.



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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-PS1 Matter and Its Interactions and MS-ESS2 Earth's Systems. 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-PS1			MS-ESS2		
California Connection		✓	✓		✓	✓
Lesson 1 – Examine how evaporation and the water cycle influence people.	✓		✓	✓		✓
Lesson 2 – Study how temperature, surface area, and wind affect evaporation.	✓		✓	✓		✓
Lesson 3 – Discuss influences of transpiration rate on plants and climate.	✓	✓	✓	✓	✓	✓
Lesson 4 – Observe how evaporation affects natural and human systems.		✓	✓		✓	
Lesson 5 – Measure the dew point and learn about dew as a water source.	✓	✓	✓	✓	✓	✓
Lesson 6 – Investigate the frost point and study its influence on natural systems.			✓		✓	✓
Traditional Unit Assessment		✓		✓	✓	✓
Alternative Unit Assessment		✓	✓		✓	✓
	SEP	DCI	CC	SEP	DCI	CC

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EEI Unit 5.3.b. Changing States: Water, Natural Systems, and Human Communities

Disciplinary Core Ideas Supported by this EEI Unit	
5-PS1 Matter and Its Interactions **MS-ESS2 Earth's Systems**	
Performance Expectations	**Suggestions for Using the EEI Unit to Support NGSS**
5-PS1-1: Develop a model to describe that matter is made of particles too small to be seen.	Use this unit to have students observe that invisible water vapor can be seen as it condenses onto the surface of a glass or can, and have them observe that evaporation takes place without students being able to "see" the water molecules as they move into the atmosphere.
5-PS1-4: Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Use the unit to have students observe an experiment in which two substances are mixed together (water and salt) and no new substances are formed.
MS-ESS2-4 *(Grade 6 in the Integrated Course Model):* Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	Use this unit to have students observe a classroom experiment that models the changes that occur in the water cycle as water changes through the three states of matter (liquid, solid, and gas). Have students use models to describe the processes involved in the water cycle as it occurs naturally on Earth.

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
Developing and Using Models (5-PS1-1, MS-ESS2-4) **Planning and Carrying Out Investigations (5-PS1-4)**	Use the unit to have students complete a model of the water cycle and use it to explain how, as a key process within the cycle, water moves through the atmosphere (Lesson 1). Have students observe multiple physical models as they participate in classroom investigations about evaporation, condensation, and transpiration (Lessons 2, 3, and 5). Use the unit to have students observe experiments related to water evaporation. They see that evaporation can be used to differentiate between glasses of fresh water and salt water (Lesson 1).	**5-PS1.A: Structure and Properties of Matter:** Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects. (5-PS1-1)	Use this unit to have students realize that matter is made of particles too small to be seen, as is evidenced through their observations on transpiration, evaporation, and condensation (Lessons 3, 4, and 5).	**Scale, Proportion, and Quantity (5-PS1-1)**	Use the unit to have students recognize that by conducting a small-scale experiment scientists can gather evaporation data they can then use to determine evaporation rates in larger systems, such as the daily water loss due to evaporation from lakes and reservoirs (Lesson 2). Have them determine that the transpiration rate measured from a small sample of plants can be used to estimate total evaporation rates for entire forests (Lessons 3 and 4). Have students consider the massive amounts of water found in different water reservoirs (for example, snowpack, clouds) and analyze information in order to determine that the total amount of freshwater on Earth is fixed (Lessons 1 and 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
		PS1.B: Chemical Reactions: When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4) **MS-ESS2.C: The Roles of Water in Earth's Surface Processes:** Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4)	Use this unit to have students mix together salt and water. Have them observe and taste the mixture to determine that a new substance has not formed (Lesson 1). Use the unit to have students recognize that water continually cycles among land, oceans, and the atmosphere through the processes of the water cycle (Lesson 1). Have them discover that these processes are dependent on the Sun (heat and light) for evaporation, condensation, and transpiration and on gravity (for precipitation) (Lessons 2, 3, and 5). Have students examine how water is naturally stored in its solid form (ice) and that California's geography and topography has been shaped by water and ice over millions of years (Lesson 6).	**Energy and Matter (MS-ESS2-4)**	Use the unit to have students recognize that the Sun drives all processes of the water cycle (Lessons 1, 2, 3, and 4). Have them realize that water molecules behave in different ways depending on their physical state (Lesson 4).