

Earth Science (NGSS-aligned from 4-Course Model for SDC Earth Science)							
Semester 1				Semester 2			
Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Instructional Segment #1: Oil and Gases		Instructional Segment #2: Climate		Instructional Segment #3: Mountains, Valleys and Coasts		Instructional Segment #4: Water and Farming	
HS-ESS2-1 ₇ * HS-ESS2-6 ₅ * HS-ESS2-7		HS-ESS2-2 ₇ HS-ESS2-4 ₂ HS-ESS2-6 ₅ * HS-ESS3-2 HS-ESS3-5 ₇ * HS-ESS3-6 ₄ HS-ETS1-1 *		HS-ESS2-1 ₇ * HS-ESS2-5 ₆ HS-ESS3-1 ₂ * HS-ESS3-4 ₇ HS-ESS3-5 ₇ * HS-ETS1-3		HS-ESS3-1 ₂ * HS-ESS3-3 ₇ HS-ESS3-5 ₇ * HS-ETS1-1 * HS-ETS1-4 ₄	
* = standard is taught more than once within this course							
EP&Cs Connections: Principle 1, 2, 3, 4, 5	ELD Connections: ELD.PI.11-12.1,5,6a-b,9,10,11a	EP&Cs Connections: Principles 1, 2, 3, 4, 5	ELD Connections: ELD.PI.11-12.1,5,6a-b,9,10,11a	EP&Cs Connections: Principles 1, 2, 3, 4, 5	ELD Connections: ELD.PI.11-12.1,5,6a-b,9,10,11a	EP&Cs Connections: Principles 1, 2, 3, 4, 5	CCSS ELD Connections: ELD.PI.11-12.1,5,6a-b,9,10,11a
CCSS ELA Connections: WHST.9-12.1a-e; SL.11-12.5 ; RST.11-12.1, 2, 7, 8	CCSS Math Connections: N-Q.1-3 ; MP.2 ; MP.4	CCSS ELA Connections: SL.11-12.5 ; RST.11-12.1 , 2, 7, 8, 9; WHST.9-12.2.a-e , 7	CCSS Math Connections: N-Q.1-3 ; MP.2 ; MP.4	CCSS ELA Connections: SL.11-12.5 ; RST.11-12.1 , 2, 7, 8, 9; WHST.9-12.2.a-e	CCSS Math Connections: MP.2 ; MP.4 ; N-Q.1-3	CCSS ELA Connections: SL.11-12.4 ; RST.11-12.1 , 2, 7, 8, 9; WHST.9-12.1.a-e , 2.a-e, 7	CCSS Math Connections: N-Q.1-3 ; A-SSE.1a-b ; A-CED.2,4 ; F-IF.5 ; S-ID.6a-c MP.2 ; MP.4

Science & Engineering Practices (SEPs)

- 1.) [Asking questions and defining problems](#)
- 2.) [Developing and using models](#)
- 3.) [Planning and carrying out investigations](#)
- 4.) [Analyzing and interpreting data](#)
- 5.) [Using mathematics and computational thinking](#)
- 6.) [Constructing explanations and designing solutions](#)
- 7.) [Engaging in argument from evidence](#)
- 8.) [Obtaining, evaluating and communicating information](#)

Crosscutting Concepts (CCCs)

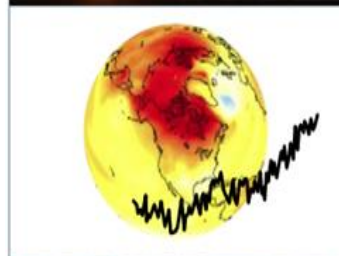
- 1.) [Patterns](#)
- 2.) [Cause and Effect](#)
- 3.) [Scale, Proportion, Quantity](#)
- 4.) [Systems and System Models](#)
- 5.) [Energy and Matter](#)
- 6.) [Structure and Function](#)
- 7.) [Stability and Change](#)

Guiding Questions:			
<i>Instructional Segment #1:</i> Oil and Gases	<i>Instructional Segment #2:</i> Climate	<i>Instructional Segment #3:</i> Mountains, Valleys and Coasts	<i>Instructional Segment #4:</i> Water and Farming
<ul style="list-style-type: none"> • Where do oil and gas come from? • How are gas and oil deposits related to carbon cycling and Earth systems? • What is the impact of driving cars and using other fossil fuels on the Earth systems? 	<ul style="list-style-type: none"> • What regulates weather and climate? • What effects are humans having on the climate? 	<ul style="list-style-type: none"> • How did California's landscape get to look the way it does today? • What forces shape the Earth's surface? • How do those processes affect humans? 	<ul style="list-style-type: none"> • Why do droughts have such a strong impact on California and other parts of the world? • How will changes in climate affect our water resources?

Table 8.8. Overview of Instructional Segments for High School Earth and Space Sciences



1 Oil and Gas
Oil and gas are resources that allow us to harness energy from ancient life but also cause us to unleash ancient carbon into the atmosphere.



2 Climate
Data reveal that carbon in our atmosphere has a big impact on global temperatures and climate. Humans, in turn, have a big impact on carbon in our atmosphere.



3 Mountains, Valleys, and Coasts
Water shapes and sculpts our landscapes. The process is sometimes thought of as slow and steady but often occurs as catastrophic events when driving forces exceed resisting forces.



4 Water and Farming
California depends on its precious water resources to sustain its people and its farms.

Earth Science- Quarter 1 Overview			
Quarter Topic Focus: Oil and Gases			
<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	Performance Expectation (PE)
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) *colors are associated with SEP (see page 1 for key)
<u>Develop a model</u> to illustrate how	<u>Earth's internal and surface</u> processes operate at different spatial and	<u>temporal scales</u> to form continental and ocean-floor features. (stability and change)	HS-ESS2-1 Textbook: pgs. 254-264, 293-294 CK-12 resources
<u>Develop a quantitative model to</u> describe	<u>the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.</u>	(<u>energy and matter</u>)	HS-ESS2-6 Textbook: pgs. 85 CK-12 resources
<u>Construct an argument</u> based on evidence about the	<u>simultaneous coevolution of Earth's systems and life on Earth.</u>	(<u>stability and change</u>)	HS-ESS2-7 Textbook: pgs. 19 CK-12 resources

Quarter Topic Focus: Climate

<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	Performance Expectation (PE)
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) *colors are associated with SEP (see page 1 for key)
<u>Analyze geoscience data</u> to make the claim that	<u>one change to Earth's surface</u> can create feedbacks that cause changes to other Earth systems.	(<u>stability and change</u>)	HS-ESS2-2 Textbook: pgs. 18-22, 731 CK-12 resources
<u>Use a model to describe how</u>	<u>variation in the flow of energy</u> into and out of Earth's systems	<u>result in</u> changes in climate. (cause and effect)	HS-ESS2-4 Textbook: pgs. 588-603 CK-12 resources
<u>Develop a quantitative</u> model to describe the cycling of	<u>carbon among the hydrosphere</u> , atmosphere, geosphere, and biosphere	(<u>Energy and Matter</u>)	HS-ESS2-6 Textbook: pgs. 85, 110, 477, 486-487 CK-12 resources
<u>Evaluate competing</u> design solutions for	<u>developing, managing, and utilizing energy and mineral</u> resources	<u>based on cost-benefit ratios.</u>	HS-ESS3-2 Textbook: pgs. 94-107, 118-119 CK-12 resources
<u>Analyze geoscience data</u> and the current results from	<u>global climate</u> models to make an evidence-based forecast of the current rate of global or regional climate change and the	associated future impacts of Earth's systems. (<u>stability and change</u>)	HS-ESS3-5 Textbook: pgs. 586-607, 731 CK-12 resources

<p>Use a computational representation to illustrate</p>	<p>the relationship among Earth systems and how those relationships are being modified</p>	<p>due to human activity (systems and system models)</p>	<p>HS-ESS3-6 Textbook: pgs. 19, 20-22, 602-603 CK-12 resources</p>
<p>Analyze a major global challenge</p>	<p>to specify qualitative and quantitative criteria and constrains for solutions that account for societal needs and wants.</p>	<p>n/a</p>	<p>HS-ETS1-1 Textbook: pgs. 102-107, 143-147, 410-413 CK-12 resources</p>

Earth Science- Quarter 3 Overview			
Quarter Topic Focus: Mountains, Valleys and Coasts			
<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	<u>Performance Expectation (PE)</u>
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) <small>*colors are associated with SEP (see page 1 for key)</small>
<u>Develop a model</u> to illustrate how	<u>Earth's internal and surface</u> processes operate at different spatial and	<u>temporal scales</u> to form continental and ocean-floor features. (stability and change)	HS-ESS2-1 Textbook: pgs. 254-264, 293-294 CK-12 resources
<u>Plan and conduct an investigation</u>	of the properties of <u>water and its effect on Earth</u> materials and surface processes.	(<u>structure and function</u>)	HS-ESS2-5 Textbook: pgs. 504-509, 590 CK-12 resources
Construct an <u>explanation based</u> on evidence of how	the availability of <u>natural resources</u> , occurrence of natural hazards, and changes in climate	have <u>influenced human activity</u> . (cause and effect)	HS-ESS3-1 Textbook: pgs. 20-22, 113-116 CK-12 resources
<u>Evaluate or refine a technological</u> solution	of <u>human activities</u> or natural systems	that <u>reduces impact</u> . (stability and change)	HS-ESS3-4 Textbook: pgs. 104-105 CK-12 resources
<u>Analyze geoscience data</u>	and the results from <u>global climate</u> models to make an evidence-based forecast of the current rate of global or regional climate change and	associated future impacts to Earth's systems. (<u>stability and change</u>)	HS-ESS3-5 Textbook: pgs. 586-607, 731 CK-12 resources

<p>Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs</p>	<p>that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.</p>	<p>n/a</p>	<p>HS-ETS1-3 Textbook: pgs. 94-107, 118-119 CK-12 resources</p>
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Earth Science- Quarter 4 Overview			
Quarter Topic Focus: Water and Farming			
<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	Performance Expectation (PE)
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) *colors are associated with SEP (see page 1 for key)
Construct an <u>explanation based</u> on evidence of how	the availability of <u>natural resources</u> , occurrence of natural hazards, and changes in climate	have <u>influenced human activity</u> . (cause and effect)	HS-ESS3-1 Textbook: pgs. 20-22, 113-116 CK-12 resources
Create a <u>computational simulation</u> to illustrate	the <u>relationships among management</u> of natural resources, the sustainability of human populations, and biodiversity.	(<u>stability and change</u>)	HS-ESS3-3 Textbook: pgs. 20-22, 94-116 CK-12 resources
<u>Analyze geoscience data</u>	and the results from <u>global climate</u> models to make an evidence-based forecast of the current rate of global or regional climate change and	associated future impacts to Earth's systems. (<u>stability and change</u>)	HS-ESS3-5 Textbook: pgs. 586-607, 731 CK-12 resources
<u>Analyze a major global challenge</u>	to specify <u>qualitative and quantitative</u> criteria and constraints for solutions that account for societal needs and wants.	n/a	HS-ETS1-1 Textbook: pgs. 102-107, 143-147, 410-413 CK-12 resources
<u>Use a computer simulation to model</u>	the <u>impact of proposed solutions</u> to a complex real-world problem with numerous criteria and constraints on	<u>interactions within and between systems</u> relevant to the problem. (systems and system models)	HS-ETS1-4 Textbook: pgs. 94-107, 118-119 CK-12 resources