

4 th Grade Science							
Semester 1				Semester 2			
Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Instructional Segment #1: Car Crashes & Renewable Energy		Instructional Segment #2: Sculpting Landscapes		Instructional Segment #3: Earthquake Engineering		Instructional Segment #4: Animal Senses	
4-PS3-1 ₅ 4-PS3-3 ₅ 4-ESS3-1 ₂ 4-PS3-2 ₅ * 4-PS3-4 ₅		4-ESS1-1 ₁ 4-ESS2-1 ₂ 4-ESS2-2 ₁ * 4-ESS3-2 ₂ * 3-5ETS1-2* 3-5-ETS1-3*		4-ESS2-2 ₁ * 4-ESS3-2 ₂ * 4-PS4-1 ₁ 3-5ETS1-1 3-5ETS1-2* 3-5ETS1-3*		4-LS1-1 ₄ 4-LS1-2 ₄ 4-PS3-2 ₅ * 4-PS4-2 ₂ 4-PS4-3 ₁	
* = standard was taught in an earlier instructional segment							
<u>EP&Cs Connections:</u> N/A	<u>ELD Connections:</u> ELD.PI.4.2, 6a, 10a, 11, 11a	<u>EP&Cs Connections:</u> N/A	<u>ELD Connections:</u> ELD.PI.4.6, 10.b	<u>EP&Cs Connections:</u> N/A	<u>ELD Connections:</u> ELD.PI.4.6, 11	<u>EP&Cs Connections:</u> Principles 1, 2	<u>ELD Connections:</u> ELD.PI.4.10
CCSS ELA Connections: RI.4.1 , 3 , 5 , 9 ; W.4.1 , 2 a-d, 7 , 8 , 9 a-b	CCSS Math Connections: N/A	CCSS ELA Connections: W.4.3 , 4 , 7 , 8 , 10 ; L.4.1 , 2 , 5 , 6	CSS Math Connections: N/A	CCSS ELA Connections: SL.4.2 ; W.4.8	CSS Math Connections: 3.MD.7b ; 4.NF.7 ; 5.G.1	CCSS ELA Connections: W.4.1 ; RI.4.3 , 7	CSS Math Connections: 4.OA.5 ; 4.MD.5 , 6 ; 4.G.3 ; MP. 2 , 4 , 5 , 6

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: Car Crashes & Renewable Energy</i>	<i>Instructional Segment #2: Sculpting Landscapes</i>	<i>Instructional Segment #3: Earthquake Engineering</i>	<i>Instructional Segment #4: Animal Senses</i>
<ul style="list-style-type: none"> • Why do car crashes cause so much damage? • What happens to energy when objects collide? • How do we get electricity and fuel to run cars and power electronic devices? • How does human use of natural resources affect the environment? 	<ul style="list-style-type: none"> • How do water, ice, wind, and vegetation sculpt landscapes? • What factors affect how quickly landscapes change? • How are landscape changes recorded by layers of rocks and fossils? • How can people minimize the effects of changing landscape on property while still protecting the environment? 	<ul style="list-style-type: none"> • How have earthquakes shaped California’s history? • How can we describe the amount of shaking in earthquakes? • How can we minimize the damage from earthquakes? 	<ul style="list-style-type: none"> • How do the internal and external structures of animals help them sense and interpret their environment? • How do senses help animals survive, grow, and reproduce? • What role does light play in how we see? • How do humans encode information and transmit it across the world?

Table 4-2. Overview of Instructional Segments for Grade Four

	<p>1 Car Crashes</p>	<p>Students investigate the energy of motion and how it transfers during collisions. They ask questions about the factors that affect energy changes during collisions.</p>
	<p>2 Renewable Energy</p>	<p>Students investigate different devices that convert energy from one form to another and then design their own device. They obtain information about how we convert natural resources into usable energy and the environmental impacts of doing so.</p>
	<p>3 Sculpting Landscapes</p>	<p>Students develop models of how sedimentary rocks form and use them to interpret the history of changes in the physical landscape. They perform investigations of the agents that erode and change landscapes.</p>
	<p>4 Earthquake Engineering</p>	<p>Students explore earthquakes from three different perspectives: They use maps to identify patterns about where earthquakes occur on Earth, they develop models that describe waves and apply them to understanding earthquake shaking, and they design earthquake-resistant structures to withstand that shaking.</p>
	<p>5 Animal Senses</p>	<p>Students develop a model of how animals see that includes their external body structures, internal body systems, and light, and information processing.</p>

Sources: Duran Ortiz 2011; Leaflet 2004; M. d'Alessio; Figure 1 at

https://en.wikipedia.org/wiki/File:Oval_ecosphere.jpg

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4 th Grade Science- Quarter 1 Overview			
Quarter Topic Focus: Car Crashes and Renewable Energy			
<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) <small>*colors are associated with SEP (see page 1 for key)</small>
Use evidence to construct an explanation	relating the speed of an object	to the energy of that object (Energy and Matter)	4-PS3-1 Textbook, pgs. 120-121, 138-139
Ask questions and predict outcomes about	the changes in energy	that occur when objects collide	4-PS3-3 Textbook, pgs. 122-127
Obtain and combine information to describe that	energy and fuels are derived from natural resources	and their uses affect the environment (Cause and Effect)	4-ESS3-1 Textbook, pgs. 193-199
Make observations to provide evidence that	energy can be transferred from place to place by sound, light, heat, and electric currents	(Energy and Matter)	4-PS3-2 Textbook, pgs. 156-157, 120-125, 136-139
Apply scientific ideas to design, test,	and refine a device that converts energy	from one form to another (Energy and Matter)	4-PS3-4 Textbook, pgs. 136-137

4 th Grade Science- Quarter 2 Overview			
Quarter Topic Focus: Sculpting Landscapes			
<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) <small>*colors are associated with SEP (see page 1 for key)</small>
Identify evidence	from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscape over time	(Patterns)	4-ESS1-1 Textbook, pgs. 306-307
Make observations and/or measurements to provide evidence of	the effects of weathering or the rate of erosion by water, ice, wind, or vegetation	(Cause and Effect)	4-ESS2-1 Textbook, pgs. 321-329, 335,337-353, R28-R35
Analyze and interpret data	from maps to describe	patterns of Earth's features (Patterns)	4-ESS2-2 Textbook, pgs. 324-328, 357
Generate and compare	multiple solutions to reduce the impacts of natural Earth processes on humans	(Cause and Effect)	4-ESS3-2 Textbook, pgs. 321-329
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	n/a	3-5ETS1-2 No textbook reference
Plan and carry out fair tests in which variables are controlled	and failure points are considered to identify aspects of a model or prototype that can be improved	n/a	3-5-ETS1-3 Textbook pgs. R28-R29

4 th Grade Science- Quarter 3 Overview			
Quarter Topic Focus: Earthquake Engineering			
<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) <small>*colors are associated with SEP (see page 1 for key)</small>
Analyze and interpret data	from maps to describe	patterns of Earth's features (Patterns)	4-ESS2-2 Textbook, pgs. 321-361
Generate and compare	multiple solutions to reduce the impacts of natural Earth processes on humans	(Cause and Effect)	4-ESS3-2 Textbook, pgs. R20-R21
Develop a model	of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move	(Patterns)	4-PS4-1 No textbook reference
Define a simple design problem	reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost	n/a	3-5ETS1-1 No textbook reference
Generate and compare multiple possible solution	to a problem based on how well each is likely to meet the criteria and constraints of the problem	n/a	3-5ETS1-2 No textbook reference
Plan and carry out fair tests in which variables are controlled	and <u>failure points are considered to identify aspects of a model or prototype that can be improved</u>	n/a	3-5ETS1-3 No textbook reference

4 th Grade Science- Quarter 4 Overview			
Quarter Topic Focus: Animal Senses			
<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) <small>*colors are associated with SEP (see page 1 for key)</small>
Construct an argument that	plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction	(<u>Systems and System Models</u>)	4-LS1-1 Textbook, pgs. 156-157, 228-237
Use a model to describe that	animals receive different types of information through their senses , process the information in their brain, and respond to the information in different ways	(<u>Systems and System Models</u>)	4-LS1-2 Textbook, pgs. R1, R10, R11
Make observations to provide evidence that	energy can be transferred from place to place by sound, light, heat, and electric currents	(<u>Energy and Matter</u>)	4-PS3-2 Textbook, pgs. 156-157, 120-125, 136-139
Develop a model to describe that	light reflecting from objects and entering the eye allows objects to be seen	(<u>Cause and Effect</u>)	4-PS4-2 Textbook, pgs. R10
Generate and compare multiple solutions	that use patterns to transfer information	(<u>Patterns</u>)	4-PS4-3 No textbook reference