Standards Map for Kindergarten Through Grade Eight
Kindergarten – California Next Generation Science Standards

K-LS1 From Molecules to Organisms: Structures and Processes

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)	***FOSS Animals Two by Two*** **IG:** pp. 75, 94, 106 (Step 11), 109, 139 (Step 1), 165, 240 **SRB:** pp. 9, 36, 47-54, 56 **DOR:** *Seashore Surprise* (Link) ***FOSS Trees and Weather*** **IG:** pp. 77, 102 (Step 4), 104 (Step 6), 108, 134, 149 (Step 7), 150, 214, 227 (Step 4), 255, 266 **SRB:** pp. 58-59 **TR:** pp. C17-C19, C34-C37				**K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.** [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of	***FOSS Animals Two by Two*** **IG:** pp. 37, 39, 41 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 87 (Step 6) IG p. 90 (Step 11) IG p. 189 (Step 14) **AC:** pp. 1-5 ***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System**			
	Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence** Scientists look for patterns and order	***FOSS Animals Two by Two*** **IG:** pp. 200 and 213								

	when making observations about the world. (K-LS1-1)	***FOSS Trees and Weather*** **IG:** p.139 (Step 1), 140 (Step 9), 145-147, 162 (Step 8) **DOR:** *Once There Was a Tree* (Link)				plants to have light; and that all living things need water.]	Embedded Assessment *Performance Assessment* IG p. 116 (Step 11) IG p. 121 (Step 9) **AC:** pp. 1, 3-6			
DCI	**LS1.C: Organization for Matter and Energy Flow in Organisms** ▪ All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)	***FOSS Animals Two by Two*** **IG:** pp. 37, 75, 88 (Step 1), 87, 90, 106 (Step 11), 151, 165, 167, 183, 189, 199, 201, 226, 240 **SRB:** pp. 5, 22, 38, 65-66, 68 ***FOSS Trees and Weather*** **IG:** pp. 41, 77, 79, 133, 159 (Step 6), 162, 213, 215, 220 (Step 6), 228 (Step 6), 242 (Step 7), 255, 257 (Step 10) **SRB:** pp. 14-19, 50, 53 **DOR:** "Who Lives Here?" (Link) *Summer* (Link)								
CCC	**Patterns** ▪ Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)	***FOSS Animals Two by Two*** **IG:** pp. 76, 97, 98, 102, 111, 113, 150, 166, 183 (Step 5), 184 (Step 3), 187, 200, 203, 221, 240								

		SRB: pp. 10-19, 20-26, 37-47, 55-63 ***FOSS Trees and Weather*** **IG:** pp. 78, 98 (Step 4), 100, 109, 116 (Step 11), 123, 134, 144 (Step 8), 146, 150, 214, 231, 243, 255, 257, 266 **SRB:** p. 59 **TR:** pp. D5-D8, D24-D25								

K-ESS2 Earth's Systems

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
		Y	N				Y	N	

SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1)	***FOSS Trees and Weather*** **IG:** pp. 174, 181, 185 (Step 7), 187, 195, 201, 202, 214, 227, 241, 254, 266 **SRB:** pp. 32-37 **TR:** pp. C17-C19, C34-C37				**K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.** [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (Such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days	***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 178 (Step 9) IG pp. 180-181 (Steps 8-9) IG p. 202 (Steps 20-21) IG p. 222 (Step 8) **AC:** pp. 2-6			
SEP	***Connections to Nature of Science*** **Science Knowledge is Based on Empirical Evidence** ▪ Scientists look for patterns and order when making observations about the world. (K-ESS2-1)	***FOSS Trees and Weather*** **IG:** pp. 180 (Step 6) and 256 (Step 9) **SRB:** p. 29									
DCI	**ESS2.D: Weather and Climate** ▪ Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1)	***FOSS Trees and Weather*** **IG:** pp. 39, 44-45, 167, 173, 175, 178 (Step 9), 202 (Steps 20-21), 205, 213, 226, 234, 253, 255, 266 **SRB:** pp. 38-40, 42-44, 59									

CCC	**Patterns** ▪ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1)	***FOSS Trees and Weather*** **IG:** pp. 174, 188, 214, 215, 240, 243, 257, 266 **SRB:** pp. 29 and 59 **TR:** pp. D5-D8, D24-D25				in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [*Assessment Boundary: Assessment of quantitative observations is limited to whole numbers and relative measures such as warmer/cooler*.]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**	**Performance Expectation**	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**
		Y	**N**				**Y**	**N**	

SEP	**EngAMing in Argument from Evidence** EngAMing in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(S). ▪ Construct an argument with evidence to support a claim. (K-ESS2-2)	***FOSS Animals Two by Two*** **IG:** pp. 127, 151, 165, 181 (Step 19), 183 (Step 5), 189, 240 ***FOSS Trees and Weather*** **IG:** pp. 78, 85 (Step 14), 91, 134, 144, 266 **TR:** pp. C25-C27, C40-C41				**K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.** [Clarification Statement: Examples of plants and animals changing their environment could include how a squirrel digs in the ground to hide its food and tree roots can break concrete.]	***FOSS Animals Two by Two*** **IG:** pp. 37, 39, 41 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 87 (Step 6) IG p. 144 (Step 12) IG p. 151 (Steps 22-23) IG p. 183 (Step 5) IG p. 189 (Step 14) **AC:** pp. 1-5 ***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 85 (Step 14) IG p. 91 (Step 16) **AC:** pp. 1, 3-6			
DCI	**ESS2.E: Biogeology** ▪ Plants and animals can change their environment. (K-ESS2-2)	***FOSS Animals Two by Two*** **IG:** pp. 37, 38-40, 41-42, 75, 87, 126, 144 (Step 12), 151, 165, 167, 176 (Step 7), 189, 228, 240 ***FOSS Trees and Weather*** **IG:** pp. 41, 42-43, 69, 77, 89 (Step 8), 127, 133, 159, 162 (Step 8), 266 **DOR:** *Once There Was a Tree* (Link)								
DCI	**ESS3.C: Human Impacts on Earth Systems** ▪ Things that people do to live	***FOSS Materials and Motion*** **IG:** pp. 137, 140								

	comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (Secondary to K-ESS2-2)	(Step 13), 141 (Step 14), 190 (Step 8), 191 (Step 1), 195, 247 (Step 2), 249 (Step 10) **SRB:** pp. 41-46 **DOR:** *What is Agriculture?* (Link) "Recycling Center" (Link)									
CCC	**Systems and System Models** ▪ Systems in the natural and designed world have parts that work together. (K-ESS2-2)	***FOSS Animals Two by Two*** **IG:** pp. 76, 85, 128, 166, 176 (Step 7), 228, 230, 266 ***FOSS Trees and Weather*** **IG:** pp. 78, 85 (Step 14), 94, 98 (Step 4) **TR:** pp. D14-D15, D28-D29									

K-ESS3 Earth and Human Activity

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**	**Performance Expectation**	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**
		Y	**N**				**Y**	**N**	

SEP	**Developing and Using Models** Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diAMram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions. ▪ Use a model to represent relationships in the natural world. (K-ESS3-1)	***FOSS Animals Two by Two*** **IG:** pp. 75, 92 (Step 4), 165, 176 (Step 7), 181 (Step 19), 240, 266 ***FOSS Trees and Weather*** **IG:** pp.78, 94, 98 (Step 4) **TR:** pp. C11-C13, C30-C31				**K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.** [Clarification Statement: Examples of	***FOSS Animals Two by Two*** **IG:** pp. 37, 39, 41 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 92 (Step 4) IG p. 95 (Step 8) IG p. 97 (Step 5) IG p. 103 (Step 14)			

DCI	**ESS3.A: Natural Resources** ▪ Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)	***FOSS Animals Two by Two*** **IG:** pp. 37, 38-39, 40-41, 74, 77, 126, 129, 151, 164, 167, 176 (Step 7), 178, 183 (Step 5), 227, 240 **SRB:** pp. 19, 38, 65 ***FOSS Trees and Weather*** **IG:** pp. 77, 79, 107 (Step 8), 116 (Step 11), 123, 213, 240, 255, 266 **SRB:** pp. 4-12, 14-19				relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]	IG p. 176 (Step 7) IG p. 180 (Step 18) **AC:** pp. 1-5 ***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 107 (Step 8) IG p. 116 (Step 11) IG p. 121 (Step 9) IG p. 240 (Step 5) IG p. 243 (Step 8) **AC:** pp. 1, 3-6			

CCC	**Systems and System Models** ▪ Systems in the natural and designed world have parts that work together. (K-ESS3-1)	***FOSS Animals Two by Two*** **IG:** pp. 75, 92 (Step 4), 106 (Step 11), 109, 128, 166, 172, 179, 240 ***FOSS Trees and Weather*** **IG:** pp. 78, 100, 103, 266 **TR:** pp. D14-D15, D28-D29									

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. ▪ Ask questions based on observations to find more information about the designed world. (K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 179, 199 (Step 12), 266 **SRB:** pp. 33-37 **TR:** pp. C7-C10, C30-C31				**K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*** [Clarification Statement: Emphasis is on local forms of severe weather.]	***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 198 (Step 10) IG p. 200 (Step 14) IG p. 202 (Steps 20-21) **AC:** pp. 2-6			
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. ▪ Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 174, 182, 198 **SRB:** pp. 44-45 **TR:** pp. C28-C29, C40-C41								
DCI	**ESS3.B: Natural Hazards** ▪ Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 44-45, 167, 173, 200 (Steps 13-14), 202 (Step 20), 266 **SRB:** pp. 42-44 **DOR:** *Come a Tide*								

		(Link)								
DCI	**ETS1.A: Defining and Delimiting an Engineering Problem** ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (Secondary to K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 44-45, 173, 200 (Steps 13-14)								
CCC	**Cause and Effect** ▪ Events have causes that generate observable patterns. (K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 188, 195, 266 **SRB:** pp. 39-40 **TR:** pp. D9-D11, D24-D27								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Interdependence of Science, Engineering, and Technology** ▪ People encounter questions about the natural world every day. (K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 175, 198, 199 **SRB:** pp. 41 and 44 **TR:** pp. D9-D11, D24-D27								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)	***FOSS Trees and Weather*** **IG:** pp. 198 and 200 (Steps 13-14) **SRB:** pp. 38-40								

Science and Engineering Practices	Publisher Citations	Meets	Reviewer Comments,	Performance	Publisher Citations	Meets	Reviewer Comments,

Disciplinary Core Ideas Crosscutting Concepts			Standard Y	Standard N	Citations, and Questions	Expectation		Standard Y	Standard N	Citations, and Questions
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. ▪ Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)	***FOSS Materials and Motion*** **IG:** pp. 86, 162, 212-213, 218, 248-249, 317 **SRB:** pp. 41-46 **TR:** pp. C28-C29, C40-C41				**K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. *** [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]	***FOSS Materials and Motion*** **IG:** pp. 45, 49 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 93 (Step 17) IG p. 103 (Step 23) IG p. 137 (Step 7) IG p. 141 (Steps 15-16) IG p. 171 (Step 13) IG p. 190 (Step 8) IG p. 195 (Step 11) IG p. 250 (Step 14) **AC:** pp. 1, 3-6			
DCI	**ESS3.C: Human Impacts on Earth Systems** ▪ Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)	***FOSS Materials and Motion*** **IG:** pp. 93, 97, 137, 141 (Step 14), 167, 190, 239, 246, 247-248, 249-250 (Step 10), 316 **SRB:** pp. 41 and 45 **DOR:** *What is Agriculture?* (Link) *Environmental Health* (Link)								
	ETS1.B: Developing Possible Solutions ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (Secondary to K-ESS3-3)	***FOSS Materials and Motion*** **IG:** pp. 31, 46-47, 48-49, 85, 143, 161, 195, 198, 249 (Step 10), 250 (Step 14), 316 **DOR:** "Recycling Center" (Link)								

CCC	**Cause and Effect** ▪ Events have causes that generate observable patterns. (K-ESS3-3)	***FOSS Materials and Motion*** **IG:** pp. 86, 137, 162, 201, 218, 317 **SRB:** p. 46 **TR:** pp. D9-D11, D24-D27									

K-PS2 Motion and Stability: Forces and Interactions

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations,	***FOSS Materials and Motion*** **IG:** pp. 265, 266, 271, 278, 286, 287, 289, 297, 304, 317 **SRB:** p. 58				**K-PS2-1. Plan and conduct an investigation to compare the effects of different**	***FOSS Materials and Motion*** **IG:** pp. 45 and 49 **FOSS Assessment System**			online roller coaster pp. 299

	based on fair tests, which provide data to support explanations or design solutions. ▪ With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1)	**TR:** pp. C14-C16, C32-C33				**strengths or different directions of pushes and pulls on the motion of an object.** [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [*Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment*	<u>Embedded Assessment</u> *Performance Assessment* IG pp. 275-276 (Step 7) IG p. 278 (Step 8) IG p. 280 (Step 15) IG p. 285 (Step 8) IG p. 286-287 (Step 5) IG p. 290 (Step 15) IG p. 295 (Step 11) IG p. 298 (Step 7) *Notebook Entry* IG p. 280 (Step 15) IG p. 290 (Step 15) IG**:** p. 299 (Step 11) IG p. 305 (Steps 11-12) **AC:** pp. 2, 4-7			
SEP	***Connections to the Nature of Science*** **Scientific Investigations Use a Variety of Methods** ▪ Scientists use different ways to study the world. (K-PS2-1)	***FOSS Materials and Motion*** **IG:** pp. 272 and 296 (Steps 1 and 3)								
DCI	**PS2.A: Forces and Motion** ▪ Pushes and pulls can have different strengths and directions. (K-PS2-1) ▪ Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1)	***FOSS Materials and Motion*** **IG:** pp. 43, 265, 268, 270, 273, 277-280, 296-299, 313, 316 **SRB:** pp. 47-57								
DCI	**PS2.B: Types of Interactions** ▪ When objects touch or collide, they push on one another and can change motion. (K-PS2-1)	***FOSS Materials and Motion*** **IG:** pp. 43, 265, 268, 270, 273, 286-290, 304-305, 313, 316 **SRB:** pp. 60-68								
DCI	**PS3.C: Relationship Between Energy and Forces** ▪ A bigger push or pull makes things speed up or slow down more quickly. (Secondary to K-PS2-1)	***FOSS Materials and Motion*** **IG:** pp. 43, 265, 268, 270, 273, 277-280, 298 (Step 7), 299 (Step 10), 313, 316								

		SRB: p. 58 **DOR: "**Roller Coaster Builder*"* (Link)				*does not include non-contact pushes or pulls such as those produced by mAMnets.*]				
CCC	**Cause and Effect** ▪ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1)	***FOSS Materials and Motion*** **IG:** pp. 265, 272, 278, 282, 286, 287, 288, 297, 204, 304, 313, 317 **TR:** pp. D9-D11, D24-D27								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**	**Performance Expectation**	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**
			Y	**N**				**Y**	**N**	
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2)	***FOSS Materials and Motion*** **IG:** pp. 271, 278, 285, 295, 297-298, 304, 317 **TR:** pp. C17-C19, C34-C37				**K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*** [Clarification Statement: Examples of problems	***FOSS Materials and Motion*** **IG:** pp. 45 and 49 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 285 (Step 8). IG p. 289 (Step 12) IG p. 290 (Step 15) IG p. 299 (Step 10) IG p. 295 (Step 11)			
DCI	**PS2.A: Forces and Motion** ▪ Pushes and pulls can have different strengths and directions. (K-PS2-2) ▪ Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-2)	***FOSS Materials and Motion*** **IG:** pp. 48-49, 270, 273, 276, 295, 297 (Step 6), 299 (Step 10), 302, 316 **SRB**: pp. 47-59 **DOR: "**Roller Coaster Builder*"*								

		(Link)				requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [*Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.*]	IG p. 298 (Step 7) IG p. 302 (Step 5) IG p. 304 (Step 5) IG p. 305 (Steps 11-12) **AC:** pp. 2-7			
DCI	**ETS1.A: Defining Engineering Problems** ▪ A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (Secondary to K-PS2-2)	***FOSS Materials and Motion*** **IG:** pp. 48-49, 270, 285, 289-290 (Steps 12-13), 316 **SRB:** pp. 9-12, 66-67								
CCC	**Cause and Effect** ▪ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-2)	***FOSS Materials and Motion*** **IG:** pp. 272, 278, 297, 304, 317 **TR:** pp. D9-D11, D24-D27								

K-PS3 Energy

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1)	***FOSS Materials and Motion*** **IG:** pp. 217, 255, 256, 258, 317 ***FOSS Trees and Weather*** **IG:** pp. 174, 178 (Step 9), 179, 266 **TR:** pp. C14-C16, C32-C33				**K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface.** [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water.] [*Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.*]	***FOSS Materials and Motion*** **IG:** pp. 45 and 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 256 (Steps 10-12) **AC:** pp.1, 3-7 ***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System** <u>Embedded Assessment</u>			
SEP	***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** ▪ Scientists use different ways to study the world. (K-PS3-1)	***FOSS Materials and Motion*** **IG:** pp. 218, 254 (Steps 2-3), 256 (Step 10) ***FOSS Trees and Weather*** **IG:** pp. 175, 179, 189 (Step 11) **SRB:** pp. 38-40								

DCI	**PS3.B: Conservation of Energy and Energy Transfer** ▪ Sunlight warms Earth's surface. (K-PS3-1)	***FOSS Materials and Motion*** **IG:** pp. 43, 48-49, 209, 217, 219, 254-256, 259 (Step 24), 316 ***FOSS Trees and Weather*** **IG**: pp. 39, 44-45, 167, 173, 185 (Step 7), 188, 266 **SRB:** pp. 20-21, 30-31					*Performance Assessment* IG p. 185 (Step 7) IG p. 188 (Steps 9-11) **AC:** pp. 2-6			
CCC	**Cause and Effect** ▪ Events have causes that generate observable patterns. (K-PS3-1)	***FOSS Materials and Motion*** **IG:** pp. 218, 255, 317 **SRB:** pp. 60-67 ***FOSS Trees and Weather*** **IG:** pp. 174, 187, 266 **SRB:** pp. 28-31 **TR:** pp. D9-D11, D24-D27								

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			Y	N				Y	N	
SEP	**Constructing Explanations and**	***FOSS Materials and***				**K-PS3-2.**	***FOSS Materials***			

	Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2)	***Motion*** **IG:** pp. 217, 253, 257, 317 **SRB:** pp. 9-12 **TR:** pp. C22-C24, C38-C39				**Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.*** [*Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.*]	***and Motion*** **IG:** pp. 45 and 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 253 (Step 9) IG p. 257 (Steps 17-18) IG p. 260 (Step 26) **AC:** pp. 1, 4-7			
DCI	**PS3.B: Conservation of Energy and Energy Transfer** ▪ Sunlight warms Earth's surface. (K-PS3-2)	***FOSS Materials and Motion*** **IG:** pp. 43, 48-49, 209, 212-213, 217, 219, 316								
CCC	**Cause and Effect** ▪ Events have causes that generate observable patterns. (K-PS3-2)	***FOSS Materials and Motion*** **IG:** pp. 218, 255, 256 (Steps 9-10), 259, 317 **TR:** pp. D9-D11, D24-D27								

K–2 Engineering Design

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems**	***FOSS Materials and Motion***				**K–2-ETS1-1. Ask**	***FOSS Materials and Motion***			

	Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. ▪ Ask questions based on observations to find more information about the natural and/or designed world(S). (K–2-ETS1-1) ▪ Define a simple problem that can be solved through the development of a new or improved object or tool. (K–2-ETS1-1)	**IG:** pp. 85, 162, 175, 177, 191, 217, 247 (Step 2), 259 (Step 24), 271, 317 **SRB:** p. 9 **TR:** pp. C7-C10, C30-C31				**questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.**	**IG:** pp. 45, 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 143 (Step 6) IG p. 147 (Step 12) IG p. 175 (Step 6) IG p. 176 (Steps 1 and 5) **AC:** pp. 3-7			
DCI	**ETS1.A: Defining and Delimiting Engineering Problems** ▪ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K–2-ETS1-1) ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K–2-ETS1-1) ▪ Before beginning to design a solution, it is important to clearly understand the problem. (K–2-ETS1-1)	***FOSS Materials and Motion*** **IG:** pp. 85, 161, 175, 217, 219, 250 (Step 14), 253 (Step 9), 257, 270, 285, 289 (Step 11), 316 **SRB:** pp. 9-12, 41-42								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models**	***FOSS Materials and***				**K–2-ETS1-2.**	***FOSS Materials***			

	Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diAMram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ▪ Develop a simple model based on evidence to represent a proposed object or tool. (K–2-ETS1-2)	***Motion*** **IG:** pp. 85, 144, 162, 190, 194, 202 (Step 13), 217, 228, 230, 260 (Step 26), 290 (Step 15), 317 ***FOSS Trees and Weather*** **IG:** pp. 197 and 266 **TR:** pp. C11-C13, C30-C31				**Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.**	***and Motion*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 198 (Step 8) IG p. 200 (Steps 5-6) IG p. 201 (Step 11) IG p. 202 (Step 14) IG p. 253 (Step 9) IG p. 257 (Step 13) **AC:** pp. 3-7 ***FOSS Trees and Weather*** **IG:** pp. 41, 43, 45 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 193 (Step 13) IG p. 197 (Step 8) **AC:** pp. 2-6			
DCI	**ETS1.B: Developing Possible Solutions** ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K–2-ETS1-2)	***FOSS Materials and Motion*** **IG:** pp. 46-47, 48-49, 85, 114 (Step 7), 119, 130, 147 (Step 12), 161,198, 217, 253 (Step 9), 270, 285, 316 ***FOSS Trees and Weather*** **IG:** pp. 173, 193 (Step 13), 197, 266 **SRB:** p. 40								
CCC	**Structure and Function** ▪ The shape and stability of structures of natural and designed objects are related to their function(S). (K–2-ETS1-2)	***FOSS Materials and Motion*** **IG:** pp. 86, 139, 141 (Step 14), 145, 162, 167 (Step 10), 201, 218, 231, 239 (Step 6), 241, 317 **SRB:** pp. 19-31, 32-40								

		FOSS Trees and Weather **IG:** pp. 197 and 266 **SRB:** p. 40 **TR:** pp. D18-D19, D30-D31								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Analyze data from tests of an object or tool to determine if it works as intended. (K–2-ETS1-3)	***FOSS Materials and Motion*** **IG:** pp. 217, 222 (Step 8), 240 (Step 5), 256, 317 ***FOSS Trees and Weather*** **IG:** pp. 197 and 266 **TR:** pp. C17-C19, C34-C37				**K–2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.**	***FOSS Materials and Motion*** **IG:** pp. 45, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 253 (Step 9) IG p. 259 (Steps 23-24)			
DCI	**ETS1.C: Optimizing the Design Solution**	***FOSS Materials and Motion***								

	▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K–2-ETS1-3)	**IG:** pp. 217, 253 (Step 9), 316 **SRB:** pp. 10-11					IG p. 260 (Step 26) **AC:** pp. 3-4, 6-7			

Standards Map for Kindergarten Through Grade Eight
Grade 1 – California Next Generation Science Standards

1-LS1 From Molecules to Organisms: Structures and Processes

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)	***FOSS Plants and Animals*** **IG:** pp. 217 (Step 19), 165, 166, 173, 175, 180, 181, 182 **TR:** pp. C23-C26, C44-C45				**1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*** [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal	***FOSS Plants and Animals*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 215 (Step 17) IG p. 217 (Step 19) Benchmark Assessment ***FOSS Plants and Animals* ACG** pp. 6-7 (Item 5) pp. 16-17 (Item 4) pp. 18-19 (Item 2)			
DCI	**LS1.A: Structure and Function** ▪ All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.	***FOSS Plants and Animals*** **IG:** pp. 98 (Step 2), 111 (Step 14), 116 (Step 25), 134, 142 (Step 6), 172, 206 (Step 13), 216 (Step 18), 244, 245, 246 (Step 20) **SRB:** pp. 57-70								

	(1-LS1-1)	**DOR: "**Animal Structure Sort" (Link) "Watch it Grow" (Link)				solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and detecting intruders by mimicking eyes and ears.]				
DCI	**LS1.D: Information Processing** ▪ Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)	***FOSS Plants and Animals*** **IG:** pp. 172, 175, 206 (Step 13), 216 (Step 18) **DOR:** *Animal Growth* (Link) "Animal Structure Sort" (Link) ***FOSS Sound and Light*** **SRB:** pp. 15-23, 60-68								
CCC	**Structure and Function** ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)	***FOSS Plants and Animals*** **IG:** pp. 98, 102, 110, 136, 145, 174, 206, 216 **TR:** pp. D19-D21, D30-D31								
CCC	***Connections to Engineering, Technology, and Applications of Science***	***FOSS Plants and Animals***								

	Influence of Science, Engineering and Technology on Society and the Natural World ▪ Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (1-LS1-1)	**IG:** pp. 215, 216, 217 **SRB:** pp. 57-70								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**	**Performance Expectation**	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**
			Y	**N**				**Y**	**N**	
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. ▪ Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)	***FOSS Plants and Animals*** **IG:** pp. 229, 254 (Step 16), 255 **SRB:** pp. 71-84 **DOR:** *Animal Offspring and Caring for Animals* (Link) **TR:** pp. C32-C33, C46-C47				**1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.** [Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying,	***FOSS Plants and Animals*** **IG:** pp. 45, 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 255 (Step 19) *Performance Assessment* IG p. 254 (Step 16)			
SEP	***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** ▪ Scientists look for patterns and order when making observations about the world. (1-LS1-2)	***FOSS Plants and Animals*** **IG:** pp. 230, 247, 253								
DCI	**LS1.B: Growth and Development of Organisms**	***FOSS Plants and Animals***								

	▪ Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)	**IG:** pp. 213 (Step 12), 214, 228, 231, 255 (Step 21), 256 **DOR:** "Find the Parent" (Link) *Animal Offspring and Caring for Animals* (Link)				cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]	Benchmark Assessment ***FOSS Plants and Animals* ACG** pp. 21-22 (Item 4)			
CCC	**Patterns** ▪ Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2)	***FOSS Plants and Animals*** **IG:** pp. 230, 253 (Step 14), 255 (Steps 20 and 21) **TR:** pp. D6-D9, D26-D27							

1-LS3 Heredity: Inheritance and Variation of Traits

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Make observations (firsthand or from media) to construct an	***FOSS Plants and Animals*** **IG:** pp. 122 (Step 10), 124 (Step 15), 245, 253, 255 (Step 21) **SRB:** pp. 23-25 **DOR:** *Find the Parent* (Link) **TR:** pp. C23-C26,				**1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly**	***FOSS Plants and Animals*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 124 (Step 16)			

	evidence-based account for natural phenomena. (1-LS3-1)	C44-C45				**like, their parents.** [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: *Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.]*	*Performance Assessment* IG p. 122 (Step 10) IG p. 125 (Step 17) IG p. 245 (Steps 17-18) <u>Benchmark Assessment</u> ***FOSS Plants and Animals* ACG** pp. 4-5 (Items 3-4) pp. 8-9 (Item 2) pp. 10-11 (Item 3) pp. 14-15 (Item 3) pp. 20-21 (Item 3)			
DCI	**LS3.A: Inheritance of Traits** ▪ Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1)	***FOSS Plants and Animals*** **IG:** pp. 228, 245 (Step 18), 247, 255, (Step 20) **DOR:** *Animal Offspring and Caring for Animals* (Link)							
DCI	**LS3.B: Variation of Traits** ▪ Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)	***FOSS Plants and Animals*** **IG:** pp. 76, 122, 123, 124, 125 (Step 17), 229, 252 (Step 8), 253 (Step 14) **SRB:** pp. 20, 21, 22, 26 **DOR:** *Animal Growth* (Link)							
CCC	**Patterns** ▪ Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1)	***FOSS Plants and Animals*** **IG:** pp. 78, 122, 230, 252 (Step 8), 253 (Step 14) **TR:** pp. D6-D9, D26-D27							

1-ESS1 Earth's Place in the Universe

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)	***FOSS Air and Weather*** **IG:** pp. 143, 183, 243, 249, 250 **SRB:** p. 37 **TR:** pp. C18-C20, C40-C43				**1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.** [Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.] [*Assessment Boundary:*	***FOSS Air and Weather*** **IG:** pp. 49, 51, 53 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 183 (Step 16) IG p. 185 (Step 20) IG p. 251 (Step 11) *Performance Assessment* IG p. 183 (Step 14) IG p. 250 (Steps 10 and 12) <u>Benchmark Assessment</u> ***FOSS Air and Weather* ACG** pp. 11-12 (Item 2)			
DCI	**ESS1.A: The Universe and its Stars** ▪ Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1)	***FOSS Air and Weather*** **IG:** pp. 135, 142, 145,161 (Step 17), 179 (Step 3), 180, 181, 182 (Step 13), 184, 185 (Step 19), 245, 251, 257 **SRB:** pp. 26-28, 33-36								
CCC	**Patterns** ▪ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1)	***FOSS Air and Weather*** **IG:** pp. 144, 161 (Step 17), 183, 184 (Step 17), 185, 244, 249, 251 **SRB:** pp. 30, 37								

		TR: pp. D6-D9, D26-D27				*Assessment of star patterns is limited to stars being seen at night and not during the day.*]	pp. 13-14 (Item 3) pp. 24-25 (Item 2) pp. 26-27 (Item 3)			
CCC	***Connections to Nature of Science*** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** ▪ Science assumes natural events happen today as they happened in the past. (1-ESS1-1) ▪ Many events are repeated. (1-ESS1-1)	***FOSS Air and Weather*** **IG:** pp. 37, 144, 161 (Step 19), 184 (Step 17), 256 (Step 7) 263, 264, 265 **SRB:** pp. 28, 29, 33-36								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**	**Performance Expectation**	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**
			Y	**N**				**Y**	**N**	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2)	***FOSS Air and Weather*** **IG:** pp. 243, 255 (Step 5), 256 (Steps 7 and 8) **TR:** pp. C14-C17, C36-C39				**1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year.** [Clarification Statement: Emphasis is on relative comparisons of the amount of	***FOSS Air and Weather*** **IG:** pp. 49, 51, 53 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 256 (Step 10) *Performance Assessment*			

DCI	**ESS1.B: Earth and the Solar System** ▪ Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)	***FOSS Air and Weather*** **IG:** pp. 242, 245, 255, 257, 264 (Step 10), 265, 266 **SRB:** pp. 55-58				daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: *Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]*	IG p. 256 (Step 6) IG p. 266 (Step 13) <u>Benchmark Assessment</u> ***FOSS Air and Weather* ACG** pp. 26-27 (Item 4)			
CCC	**Patterns** ▪ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-2)	***FOSS Air and Weather*** **IG:** pp. 244, 255, 263, 264 (Step 10), 265, 266 (Step 13) **TR:** pp. D6-D9, D26-D27								

1-PS4 Waves and their Applications in Technologies for Information Transfer

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Plan and conduct investigations collaboratively to produce data to serve as the basis for	***FOSS Sound and Light*** **IG:** pp. 81, 91, 95, 105, 106, 115, 129, 136, 153 **SRB:** pp. 7, 32 **TR:** pp. C14-C17, C36-C39				**1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials**	***FOSS Sound and Light*** **IG:** pp. 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 97 (Step 18) IG p. 111 (Step 25)			

	evidence to answer a question. (1-PS4-1)					**vibrate.** [Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]	IG p. 156 (Step 14) IG p. 164 (Step 15) *Performance Assessment* IG p. 106 (Step 10) IG p. 137 (Step 10) IG p. 164 (Step 11) <u>Benchmark Assessment</u> ***FOSS Sound and Light* ACG** pp. 2-3 (Items 1-2) pp. 4-5 (Item 3) pp. 6-7 (Item 4) pp. 8-9 (Item 1) pp. 10-11 (Item 3)			
SEP	***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** ▪ Science investigations begin with a question. (1-PS4-1) ▪ Scientists use different ways to study the world. (1-PS4-1)	***FOSS Sound and Light*** **IG:** pp. 82, 90, 92, 93, 110, 147, 152-153, 163 **SRB:** pp. 8-14								
DCI	**PS4.A: Wave Properties** ▪ Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)	***FOSS Sound and Light*** **IG:** pp.80, 92 (Step 6), 93, 97, 106 (Step 11), 109 (Step 21), 128, 131, 154 (Step 9), 155 (Step 11) **SRB:** pp. 6, 9, 25 **DOR:** *All about Sound* (Link)								
CCC	**Cause and Effect** ▪ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1)	***FOSS Sound and Light*** **IG:** pp. 82, 92, 95, 106, 109, 130, 137 **TR:** pp. D6-D9, D10-D12								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-PS4-2)	***FOSS Sound and Light*** **IG:** pp. 213, 236, 239-240 **SRB:** p. 60 **TR:** pp. C23-C26, C44-C45				**1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.** [Clarification Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object	***FOSS Sound and Light*** **IG:** pp. 47, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 240 (Step 17) *Performance Assessment* IG p. 236 (Step 10) IG p. 240 (Step 18) <u>Benchmark Assessment</u> ***FOSS Sound and Light* ACG** pp. 22-23 (Item 4) pp. 26-27 (Item 2) pp. 28-29 (Item 5)			
DCI	**PS4.B: Electromagnetic Radiation** ▪ Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2	***FOSS Sound and Light*** **IG:** pp. 50. 50-51, 213, 215, 236-237 (Step 10), 234, 240 (Step 16), 246, 248, 254 (Step 2) **SRB:** p. 57 **DOR:** *Light and Darkness* (Link)								
CCC	**Cause and Effect** ▪ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-2),	***FOSS Sound and Light*** **IG:** pp. 214, 236, 244 **TR:** pp. D6-D9, D10-D12								

						giving off its own light.]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-3)	***FOSS Sound and Light*** **IG:** pp. 175, 181, 186, 188, 198, 213, 220, 222, 227 **SRB:** pp. 44-45 **TR:** pp. C14-C17, C36-C39				**1-PS4-3. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.** [Clarification Statement: Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective	***FOSS Sound and Light*** **IG:** pp. 47, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 182 (Step 14) IG p. 183 (Step 15) IG p. 200 (Step 14) *Performance Assessment* IG p. 188 (Step 8) <u>Benchmark Assessment</u> ***FOSS Sound and Light* ACG** pp. 16-17 (Item 1) pp. 18-19 (Item 2) pp. 20-21 (Item 3)			
DCI	**PS4.B: Electromagnetic Radiation** ▪ Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences	***FOSS Sound and Light*** **IG:** pp. 30, 46-47, 50-51, 175, 177, 182 (Step 13), 189 (Step 13), 191 (Steps 17-18), 192 (Step 18), 199 (Steps 11 and 13), 208 **SRB:** p. 43 **DOR:** *Light and Shadows* (Link)								

	with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1-PS4-3)	*All about Light* (Link) *My Shadow* (Link)				(such as a mirror).] [*Assessment Boundary: Assessment does not include the speed of light*.]	pp. 24-25 (Item 1) pp. 28-29 (Item 5)			
CCC	**Cause and Effect** ▪ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-3)	***FOSS Sound and Light*** **IG:** pp. 176, 181, 188, 196, 214, 220, 221, 222, 230, **SRB:** pp. 41, 42 **TR:** pp. D6-D9, D10-D12								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**	**Performance Expectation**	**Publisher Citations**	**Meets Standard**		**Reviewer Comments, Citations, and Questions**
			Y	**N**				**Y**	**N**	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)	***FOSS Sound and Light*** **IG:** pp. 129, 161, 162, 163, 164, 213, 247 **TR:** pp. C23-C26, C44-C45				**1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.*** [Clarification Statement: Examples of devices could	***FOSS Sound and Light*** **IG:** pp. 47, 49, 51 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 164 (Step 15) IG p. 247 (Step 19) *Performance Assessment*			
DCI	**PS4.C: Information Technologies and Instrumentation** ▪ People also use a variety of	***FOSS Sound and Light*** **IG:** pp. 128,163, 212,								

	devices to communicate (send and receive information) over long distances. (1-PS4-4)	248 (Step 20), 249, 247 (Step 13), **SRB:** pp. 69-75				include a light source to send signals, paper cup and string "telephones," and a pattern of drum beats.] [*Assessment Boundary: Assessment does not include technological details for how communication devices work.*]	IG p. 164 (Step 11) IG p. 246 (Step 8) Benchmark Assessment ***FOSS Sound and Light* ACG** pp. 28-29 (Item 5) pp. 30-31 (Item 6)			
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)	***FOSS Sound and Light*** **IG:** pp. 249 (Step 22) **SRB:** p. 76								

K–2 Engineering Design

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. ▪ Ask questions based on observations to find more information about the natural and/or designed world(s). (K–2-ETS1-1)	***FOSS Sound and Light*** **IG:** pp. 129, 161, 164, 213, 246, 247 (Step 13) **SRB:** pp. 70-73 ***FOSS Air and Weather*** **IG:** pp. 84, 100, 101,				**K–2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to**	***FOSS Sound and Light*** **IG:** pp. 49, 51 **FOSS Assessment System** Embedded Assessment *Notebook Entry*			

		109 **SRB:** p. 6 **TR:** pp. C7-C10, C34-C35				**define a simple problem that can be solved through the development of a new or improved object or tool.**	IG p. 164 (Step 15) IG p. 247 (Step 19) *Performance Assessment* IG p. 164 (Step 11) IG p. 246 (Step 8) ***FOSS Air and Weather*** **IG:** p. 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 109 (Step 27) *Performance Assessment* IG p. 108 (Step 23) IG p. 109 (Step 25) <u>Benchmark Assessment</u> ***FOSS Air and Weather* ACG** pp. 8-9 (Item 6)			
DCI	**ETS1.A: Defining and Delimiting Engineering Problems** ▪ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K–2-ETS1-1) ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K–2-ETS1-1) ▪ Before beginning to design a solution, it is important to clearly understand the problem. (K–2-ETS1-1)	***FOSS Sound and Light*** **IG:** pp. 160 (Step 4), 163 (Steps 8-9), 164 (Steps 11-13), 165, 243 (Step 5), 245 (Step 5), 246 (Step 1), 249 (Step 22) **SRB:** p. 76 ***FOSS Air and Weather*** **IG:** pp. 84, 100, (Step 3), 101 (Step 5), 104, 109 **DOR:** *Friction and Air Resistance* (Link)							

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ▪ Develop a simple model based on evidence to represent a proposed object or tool. (K–2-ETS1-2)	***FOSS Sound and Light*** **IG:** pp. 93 (Step 9), 110 (Step 22), 139 (Step 18), 161 (Step 2), 162, 163, 245, 246,247 (Step 15) **SRB:** pp. 6, 9 ***FOSS Air and Weather*** **IG:** pp. 84, 105 (Step 17), 109 ***FOSS Plants and Animals*** **IG:** pp. 173, 181, 217 (Step 19) **TR:** pp. C11-C13, C34-C37				**K–2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.**	***FOSS Sound and Light*** **IG:** pp. 49, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 164 (Step 12) IG p. 247 (Step 15) *Performance Assessment* IG p. 164 (Step 11) IG p. 246 (Step 8) ***FOSS Air and Weather*** **IG:** p. 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 109 (Step 26)			
DCI	**ETS1.B: Developing Possible Solutions** ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K–2-ETS1-2)	***FOSS Sound and Light*** **IG:** pp. 161 (Step 1), 162 (Step 5), 164 (Step 12), 243, 247 (Steps 15 and 19) ***FOSS Air and Weather***								

		IG: pp. 50-51, 109 **SRB:** p. 6 ***FOSS Plants and Animals*** **IG:** pp. 172, 180 (Step 9), 181, 217					*Performance Assessment* IG p. 109 (Steps 24-25) <u>Benchmark Assessment</u> ***FOSS Air and Weather* ACG** pp. 8-9 (Item 6) ***FOSS Plants and Animals*** **IG:** p. 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 217 (Step 19) *Performance Assessment* IG p. 181 (Step 12) <u>Benchmark Assessment</u> ***FOSS Plants and Animals* ACG** pp. 278-279 (Item 1) pp. 282-283 (Item 4)			
CCC	**Structure and Function** ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (K–2-ETS1-2)	***FOSS Sound and Light*** **IG:** p. 140 (Step 19) ***FOSS Air and Weather*** **IG:** pp. 85, 109 ***FOSS Plants and Animals*** **IG:** pp. 174, 215 **TR:** pp. D19-D21, D30-D31								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Analyze data from tests of an object or tool to determine if it works as intended. (K–2-ETS1-3)	***FOSS Sound and Light*** **IG:** pp. 164 (Step 13), 246, 247 (Step 16), 248 ***FOSS Air and Weather*** **IG:** pp. 84, 105 (Step 16), 109 **TR:** pp. C18-C20, C40-C43				**K–2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.**	***FOSS Sound and Light*** **IG:** pp. 49, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 164 (Step 15) IG p. 247 (Step 16) *Performance Assessment* IG p. 164 (Step 13) IG p. 246 (Step 8) <u>Benchmark Assessment</u> ***FOSS Sound and Light* ACG** pp. 30-31 (Item 6) ***FOSS Air and Weather*** **IG:** p. 51			
DCI	**ETS1.C: Optimizing the Design Solution** ▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K–2-ETS1-3)	***FOSS Sound and Light*** **IG:** pp. 164 (Step 13), 247 (Step 16) ***FOSS Air and Weather*** **IG:** pp. 83, 101, 102, 108,109								

							FOSS Assessment System <u>Embedded Assessment</u> *Notebook Entry* IG p. 109 (Step 27) *Performance Assessment* IG p. 109 (Step 25) <u>Benchmark Assessment</u> ***FOSS Air and Weather* ACG** pp. 8-9 (Item 6)			

Standards Map for Kindergarten Through Grade Eight
Grade 2 – California Next Generation Science Standards

2-LS2 Ecosystems: Interactions, Energy, and Dynamics

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1)	***FOSS Insects and Plants*** **IG:** pp. 127, 128, 135, 144, 146-147, 152-153, 157, 174 **TR:** pp. C14-C16, C34-C37				**2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.** [Assessment Boundary: Assessment is limited to testing one variable at a time.]	***FOSS Insects and Plants*** **IG:** pp. 45 and 47 **FOSS Assessment System** Embedded Assessment *Notebook Entry* **IG:** p. 146 (Steps 10-11) *Performance Assessment* **IG:** p. 153 (Step 6) Benchmark Assessment ***FOSS Insects and Plants* ACG** pp. 6-7 (Items 2-3) pp. 12-13 (Item 6) pp. 16-17 (Items 4-			
DCI	**LS2.A: Interdependent Relationships in Ecosystems** ▪ Plants depend on water and light to grow. (2-LS2-1)	***FOSS Insects and Plants*** **IG:** pp. 100-101 (Step 21), 145, 146 (Step 14), 147 (Step 15), 155-156 (Step 12), 157 (Steps 16 and 17), 173 (Step 2) **SRB:** pp. 6-8 **DOR:** *How Plants Grow* (Link)								

CCC	**Cause and Effect** ▪ Events have causes that generate observable patterns. (2-LS2-1)	***FOSS Insects and Plants*** **IG:** pp. 136, 148, 156, 157, 159 **TR:** pp. D9-D11, D26-D27					6) pp. 26-27 (Item 5)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Developing and Using Models** Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ▪ Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)	***FOSS Insects and Plants*** **IG:** pp. 135, 178, 287, 315, 317 **TR:** pp. C11-C13, C32-C33				**2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.***	***FOSS Insects and Plants*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* **IG:** p. 315 (Step 8) **IG:** p. 315 (Step 14, 15) <u>Benchmark Assessment</u> ***FOSS Insects and Plants* ACG** pp. 10-11 (Item 5) pp. 24-25 (Item 4)			
DCI	**LS2.A: Interdependent Relationships in Ecosystems** ▪ Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)	***FOSS Insects and Plants*** **IG:** pp. 157, 158 (Steps 19-22), 165, 177, 178 (Step 21) **SRB:** pp. 27-34, 39 **DOR:** *How Seeds get Here … and There* (Link) *What Is Pollination?* (Link)								

DCI	**ETS1.B: Developing Possible Solutions** ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to 2-LS2-2)	***FOSS Insects and Plants*** **IG:** pp. 178, 287, 315, 317, 318								
CCC	**Structure and Function** ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2)	***FOSS Insects and Plants*** **IG:** pp. 84, 85, 158, 162, 163, 165, 168, 175, 177, 178, 190, 288 **TR:** pp. D18-D20, D30-D31								

2-LS4 Biological Evolution: Unity and Diversity

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Make observations (firsthand or	***FOSS Insects and Plants*** **IG:** pp. 107, 176, 189, 201, 219, 237, 245, 251, 271, 315 **TR:** pp. C14-C16, C34-C37				**2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.** [Clarification Statement:	***FOSS Insects and Plants*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry*			

	from media) to collect data, which can be used to make comparisons. (2-LS4-1)					Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]	IG p. 120 (Step 9) **IG:** p. 121 (Step 12) **IG:** p. 306 (Step 11) *Performance Assessment* **IG:** p. 107 (Step 5) <u>Benchmark Assessment</u> ***FOSS Insects and Plants* ACG** pp. 2-3 (Item 2) pp. 4-5 (Items 3-5) pp. 14-15 (Items 1 and 3) pp. 18-19 (Item 1) pp. 20-21 (Item 3) pp. 22-23 (Items 1-2) pp. 24-25 (Item 3)			
SEP	***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** Scientists look for patterns and order when making observations about the world. (2-LS4-1)	***FOSS Insects and Plants*** **IG:** pp. 93, 100, 113, 121, 190, 218, 220, 224									
DCI	**LS4.D: Biodiversity and Humans** ▪ There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)	***FOSS Insects and Plants*** **IG:** pp. 107, 112-115, 176, 205, 218, 255, 256, 264, 270, 300, 318 **SRB:** pp. 18-26, 35-40, 41-45 **DOR:** *All About Water Ecosystems* (Link) *Bugs* (Link) *Habitat Gallery* (Link) *Habitat Havoc* (Link) *House and Backyard Insects* (Link) *Where Does It Live?* (Link)									

2-ESS1 Earth's Place in the Universe

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-ESS1-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 79, 89, 96, 129, 146, 162, 168, 228, 235, 245, 250, 256 **TR:** pp. C22-C24, C42-C45				**2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.** [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 90 (Step 13) *Performance Assessment* IG pp. 97-98 (Step 14) <u>Benchmark Assessment</u> ***FOSS Pebbles, Sand, and Silt* ACG** pp. 4-5 (Item 4) pp. 12-13 (Items 4ab)			
DCI	**ESS1.C: The History of Planet Earth** ▪ Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 88 (Step 8), 89 (Step 9), 90, 97, 110, 144-145, 167 (Step 30), 236 **SRB**: pp. 7 and 78 **DOR:** *All About Volcanoes* (Link) *All About Land Formations* (Link)								

CCC	**Stability and Change** ▪ Things may change slowly or rapidly. (2-ESS1-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 80, 89, 95, 97, 130, 145, 165, 228, 236 **TR:** pp. D21-D23, D30-D31				quantitative measurements of timescales.]				

2-ESS2 Earth's Systems

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Compare multiple solutions to a problem. (2-ESS2-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 79, 129, 219, 220, 228, 256, 259 **TR:** pp. C22-C24, C42-C45				**2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*** [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 259 (Step 7) Benchmark Assessment ***FOSS Pebbles, Sand, and Silt* ACG** pp. 12-13 (Items 4ab) pp. 22-23 (Item 4)			
DCI	**ESS2.A: Earth Materials and Systems** ▪ Wind and water can change the shape of the land. (2-ESS2-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 95, 110, 144, 145, 163, 166, 165, 168, 256, 259, 260 **SRB*:*** pp. 3-10, 14-21, 22-23, 24-30, 68-78 **DOR*:*** *All About Land Formations* (Link)								

DCI	**ETS1.C: Optimizing the Design Solution** ▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary to 2-ESS2-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 49, 142, 219, 220, 221, 227, 256 **SRB:** pp. 68-78				and water, and different designs for using shrubs, grass, and trees to hold back the land.]				
CCC	**Stability and Change** ▪ Things may change slowly or rapidly. (2-ESS2-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 2, 3, 45, 49, 80, 81, 89, 95, 97, 97, 110, 123, 125, 130, 131, 144, 145, 163, 165, 166, 168, 220, 221, 227, 228, 229, 240, 256, 259, 260 **TR:** pp. D21-D23, D30-D31								
CCC	***Connections to Nature of Science*** **Science Addresses Questions About the Natural and Material World** Scientists study the natural and material world. (2-ESS2-1)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 80, 88, 100, 107, 114, 130, 134, 221, 227, 240, 250, 256 **SRB*:*** pp. 50-60, 68-78								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on**	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 219, 220, 221, 227, 228, 256, 260 **SRB:** pp. 68-78								

	Society and the Natural World ▪ Developing and using technology has impacts on the natural world. (2-ESS2-1)									

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ▪ Develop a model to represent patterns in the natural world. (2-ESS2-2)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 129, 165, 168, 227, 250, 258 **TR:** pp. C11-C13, C32-C33				**2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.** [Assessment Boundary: Assessment does not include quantitative scaling in models.]	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 259 (Step 7) <u>Benchmark Assessment</u> ***FOSS Pebbles, Sand, and Silt* ACG** pp. 24-25 (Item 6)			
DCI	**ESS2.B: Plate Tectonics and Large-Scale System Interactions** ▪ Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 47, 49, 227, 229, 250-251, 258, 259 **SRB*:*** pp. 81-91								
CCC	**Patterns** ▪ Patterns in the natural world can be observed. (2-ESS2-2)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 252 (Step 8), 253 (Step 10), 257 (Step 3) **TR:** pp. D6-D8, D26-D27								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. ▪ Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 228, 251, 252, 256, 258 **TR:** pp. D30-D31, D44-D47				**2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.**	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 45, 47, 49 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 253 (Step 12) <u>Benchmark Assessment</u> ***FOSS Pebbles, Sand, and Silt*** **ACG** pp. 20-21 (Item 3) pp. 22-23 (Item 5)			
DCI	**ESS2.C: The Roles of Water in Earth's Surface Processes** ▪ Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 227, 250, 251, 252, 253 **SRB***:* pp. 50-60, 61-67								
CCC	**Patterns** ▪ Patterns in the natural world can be observed. (2-ESS2-3)	***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 251 (Step 4), 251 (Step 6), 252 (Step 9) **TR:** pp. D6-D8, D26-D27								

Publisher: Delta Education
Program Title: FOSS Next Generation Elementary
Components: Investigations Guide (IG), Science Resources Book (SRB), Digital-Only Resources (DOR), Teacher Resources Book (TR), Science Notebook Masters (SNM), Teacher Masters (TM), Assessment Coding Guide (ACG)

2-PS1 Matter and Its Interactions

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1)	***FOSS Solids and Liquids*** **IG:** pp. 77, 86, 100, 107, 122, 139, 147, 148, 162, 170, 183, 191, 199, 217, 233, 240, 242 **TR:** pp. C14-C16, C34-C37				**2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.** [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]	***FOSS Solids and Liquids*** **IG:** pp. 43, 45, 47 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 90 (Step 14) IG p. 101 (Step 13) IG p. 157 (Step 18) IG p. 194 (Step 16) IG p. 245 (Step 23) IG p. 252 (Step 13) *Performance Assessment* IG p. 107 (Step 7) IG p. 148 (Step 7) IG p. 205 (Step 7) <u>Benchmark Assessment</u> ***FOSS Solids and Liquids* ACG** p. 2-3 (Item 1) pp. 6-7 (Item 5)			
DCI	**PS1.A: Structure and Properties of Matter** ▪ Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1)	***FOSS Solids and Liquids*** **IG:** pp. 94, 101 (Step 11), 108, 109, 123, 128, 147, 155, 156, 183, 193 **SRB:** pp. 10, 14-19, 31-32, 40-42, 46-47, 49, 50 **DOR:** *All About the Properties of Matter* (Link) *Properties of Materials* (Link) *Clothing and Building Materials* (Link)								

CCC	**Patterns** ▪ Patterns in the natural and human designed world can be observed. (2-PS1-1)	***FOSS Solids and Liquids*** **IG:** pp. 78, 107,140, 148, 184, 205, 211 **SRB:** pp. 44-46, 52-53 **TR:** pp. D6-D8, D26-D27					pp. 8-9 (Item 1) pp. 10-11 (Item 3) pp. 14-15 (Items 1-2) pp. 16-17 (Item 3) pp. 18-19 (Item 1)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2)	***FOSS Solids and Liquids*** **IG: pp.** 78, 114 (Step 6), 116 (Step 13), 119 (Step 23) **TR:** pp. C17-C19, C38-C41				**2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*** [Clarification Statement: Examples of properties could include strength, flexibility,	***FOSS Solids and Liquids*** **IG:** pp. 43, 45, 47 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 211 (Step 7) *Performance Assessment* IG p. 115 (Step 8) IG p. 199 (Step 8) <u>Benchmark Assessment</u>			
DCI	**PS1.A: Structure and Properties of Matter** ▪ Different properties are suited to different purposes. (2-PS1-2)	***FOSS Solids and Liquids*** **IG:** pp. 77, 102 (Step 15), 113 (Step 1), 117 (Step 15), 118, 119 (Step 24), 277 (Step 10) **SRB:** pp. 18, 19, 22-25, 26-30 **DOR:** *Properties of Materials* (Link) *Clothing and Building Materials* (Link)								

CCC	**Cause and Effect** ▪ Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2)	***FOSS Solids and Liquids*** **IG:** pp. 114 (Step 7), 116, 117 (Step 15) **TR:** pp. D9-D11, D26-D27				hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]	***FOSS Solids and Liquids* ACG** pp. 4-5 (Item 3) pp. 6-7 (Item 4)			
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (2-PS1-2)	***FOSS Solids and Liquids*** **IG:** pp. 78, 113, 116 (Step 13), 117 (Step 16), 124, 125 **SRB:** pp. 14-17							

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3)	***FOSS Solids and Liquids*** **IG:** pp. 78, 115, 117 **TR:** pp. C22-C24, C42-C45				**2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled**	***FOSS Solids and Liquids*** **IG:** pp. 43, 45, 47 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 115 (Step 8)			

DCI	**PS1.A: Structure and Properties of Matter** ▪ Different properties are suited to different purposes. (2-PS1-3) ▪ A great variety of objects can be built up from a small set of pieces. (2-PS1-3)	***FOSS Solids and Liquids*** **IG:** pp. 77, 113, 115, 116, 118, 119, 217, **SRB:** pp. 12, 13, 17, 20				**and made into a new object.** [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]	IG p. 118 (Step 21) <u>Benchmark Assessment</u> ***FOSS Solids and Liquids* ACG** pp. 6-7 (Item 4)			
CCC	**Energy and Matter** ▪ Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3)	***FOSS Solids and Liquids*** **IG:** pp. 102, 103, 114 (Step 7), 234, 266 **TR:** pp. D16-D17, D28-D29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Engaging in Argument from Evidence** ● Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s). ● Construct an argument with evidence to support a claim.	***FOSS Solids and Liquids*** **IG:** pp. 233, 242-243 (Step 14), 259, 268, 272 (Step 26) **TR:** pp. C25-C29, C44-C45				**2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.** [Clarification Statement: Examples of reversible changes could include	***FOSS Solids and Liquids*** **IG:** pp. 43, 47 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 245 (Step 23) IG p. 252 (Step 13) IG p. 269 (Step 19) *Performance Assessment*			
	Connections to Nature of Science **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** ● Science searches for cause and effect relationships to explain natural events.	***FOSS Solids and Liquids*** **IG:** pp. 234, 246, 266, 267, 269, 272 **SRB:** p. 64								

DCI	**PS1.B: Chemical Reactions** ▪ Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)	***FOSS Solids and Liquids*** **IG:** 227, 233, 235, 242 (Step 12), 243 (Step 15), 266 (Step 8), 267, 268, 269, 270, 271, 272 **SRB:** pp. 62-67, 68-76 **DOR**: *Solids and Liquids* (Link) *Change It!* (Link)				materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]	IG p. 259 (Step 11) Benchmark Assessment ***FOSS Solids and Liquids* ACG** pp. 20-21 (Item 2) pp. 22-23 (Item 3) pp. 24-25 (Item 4)			
CCC	**Cause and Effect** ▪ Events have causes that generate observable patterns. (2-PS1-4)	***FOSS Solids and Liquids*** **IG:** pp. 234, 244, 245, 258, 259, 265, 266, 267, 268, 270 **TR:** pp. D9-D11, D26-D27								

K–2 Engineering Design

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. ▪ Ask questions based on observations to find more	***FOSS Insects and Plants*** **IG:** pp. 189, 201 (Step 4), 203, 221 (Step 13), 299 (Step 1), 304 (Step 3) ***FOSS Pebbles,***				**K–2-ETS1-1. Ask questions, make observations, and gather information about a**	***FOSS Insects and Plants*** **IG:** p. 49 **FOSS Assessment System**			

	information about the natural and/or designed world(s). (K–2-ETS1-1) ▪ Define a simple problem that can be solved through the development of a new or improved object or tool. (K–2-ETS1-1)	***Sand, and Silt*** **IG:** pp. 181, 195, 211, 212, 214, 227, 229, 233, 243 ***FOSS Solids and Liquids*** **IG:** pp. 114 (Step 5), 117 (Step 16) **TR:** pp. C7-C10, C32-C33				**situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.**	Embedded Assessment *Notebook Entry* IG p. 204 (Step 18) IG p. 222 (Steps 17-20) *Performance Assessment* IG p. 250 (Step 4) ***FOSS Pebbles, Sand, and Silt*** **IG:** p. 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 190 (Step 14) IG p. 195 (Step 15) IG p. 257 (Step 4) ***FOSS Solids and Liquids*** IG p. 45 **FOSS Assessment System** Embedded			
DCI	**ETS1.A: Defining and Delimiting Engineering Problems** ▪ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K–2-ETS1-1) ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K–2-ETS1-1) ▪ Before beginning to design a solution, it is important to clearly understand the problem. (K–2-ETS1-1)	***FOSS Insects and Plants*** **IG:** pp. 221, 250, 299, 304 ***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 180, 186-188, 189, 190, 194, 195, 200, 201, 206, 207, 211, 212 **SRB:** p. 71 ***FOSS Solids and Liquids*** **IG:** pp. 113, 114, 117 **SRB:** pp. 21 and 30								

							Assessment *Notebook Entry* IG p. 116 (Step 13) IG p. 119 (Step 23) *Performance Assessment* IG p. 115 (Step 8) Benchmark Assessment ***FOSS Solids and Liquids* ACG** pp. 6-7 (Item 4)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ▪ Develop a simple model based on evidence to represent a proposed object or tool. (K–2-ETS1-2)	***FOSS Insects and Plants*** **IG:** pp. 189, 221, 222, 315, 317 **FOSS Pebbles, Sand, and Silt** **IG:** pp. 143, 173, 227, 258 ***FOSS Solids and Liquids*** **IG:** pp. 77, 117, 118 **TR:** pp. C11-C13, C32-C33				**K–2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.**	***FOSS Insects and Plants*** **IG:** pp. 47, 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 317 (Step 15) ***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 49			

DCI	**ETS1.B: Developing Possible Solutions** ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K–2-ETS1-2)	***FOSS Insects and Plants*** **IG:** pp. 189, 221, 222, 315, 317 **FOSS Pebbles, Sand, and Silt** **IG:** pp. 174, 175, 214, 227, 233 **SRB:** pp. 38-39 ***FOSS Solids and Liquids*** **IG:** pp. 77, 117, 118					**FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 259 (Step 7) ***FOSS Solids and Liquids*** **IG:** pp. 45 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 116 (Step 13). IG p. 119 (Step 23) *Performance Assessment* IG p. 115 (Step 8) <u>Benchmark Assessment</u> ***FOSS Solids and Liquids* ACG** pp. 6-7 (Item 4)			
CCC	**Structure and Function** ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (K–2-ETS1-2)	***FOSS Insects and Plants*** **IG:** pp. 315 and 317 **FOSS Pebbles, Sand, and Silt** **IG:** pp. 194 (Step 10), 195 (Step 14) **SRB:** pp. 34-35 ***FOSS Solids and Liquids*** **IG:** pp. 78, 115, 116, 117, 119 **SRB:** pp. 22-25, 26-30 **TR:** pp. D18-D20, D30-D31								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ▪ Analyze data from tests of an object or tool to determine if it works as intended. (K–2-ETS1-3)	***FOSS Insects and Plants*** **IG:** p. 317 (Step 15) **FOSS Pebbles, Sand, and Silt** **IG:** pp.181, 187, 194, 201 ***FOSS Solids and Liquids*** **IG:** pp. 78, 117 (Step 18),118 (Step 21) **SRB:** pp. 22-25, 26-30 **TR:** pp. C17-C19, C38-C41				**K–2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.**	***FOSS Insects and Plants*** **IG:** p. 49 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 222 (Step 18) IG p. 317 (Step 15) ***FOSS Pebbles, Sand, and Silt*** **IG:** p. 49 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 200 (Step 8)			
DCI	**ETS1.C: Optimizing the Design Solution** ▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K–2-ETS1-3)	***FOSS Insects and Plants*** **IG:** pp. 188, 222 (Step 18), 317 (Step 15) ***FOSS Pebbles, Sand, and Silt*** **IG:** pp. 200, 206, 212 **SRB:** p. 71								

		FOSS Solids and Liquids **IG:** pp. 113 (Step 1), 116 (Step 13, 15), 117 (Step 18), 118 (Step 21) **SRB:** pp. 26-30					***FOSS Solids and Liquids*** **IG:** pp. 45 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 116 (Step 13) IG p. 119 (Step 23) *Performance Assessment* IG p. 115 (Step 8) <u>Benchmark Assessment</u> ***FOSS Solids and Liquids* ACG** pp. 6-7 (Item 4)			

Standards Map for Kindergarten Through Grade Eight
Grade 3 – California Next Generation Science Standards

3-LS1 From Molecules to Organisms: Structures and Processes

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Develop models to describe phenomena. (3-LS1-1)	***FOSS Structures of Life*** **IG:** pp. 81, 82, 87, 90, 135, 137, 146, 152, 170 **TR:** pp. C11-C13, C36-C37				**3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.** [Clarification Statement: Changes organisms go through during their life form a pattern.] [*Assessment Boundary: Assessment of plant life cycles is limited to those of*	***FOSS Structures of Life*** **IG:** pp. 47, 49 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 170 (Step 13) Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 6-7 (Item 4ab) pp. 9-10 (Item 6) pp. 16-17 (Item 12) Interim Assessment *Life Science Task 1— Life Cycles*			
SEP	***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** ▪ Science findings are based on recognizing patterns. (3-LS1-1)	***FOSS Structures of Life*** **IG:** pp. 104, 117 (Step 20), 119 (Step 25), 162 (Step 17), 173 **SRB:** p. 12-15								
DCI	**LS1.B: Growth and Development of Organisms** ▪ Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)	***FOSS Structures of Life*** **IG:** pp. 82, 83, 84, 86, 88-89, 91, 99, 140, 145, 147, 149 151-152, 153, 169-171 (Steps 9-15), 173 (Steps 21-21), 182 **SRB:** p. 3-7, 22-25,								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
		26-33, 47-49 **DOR:** "Life Cycles" (Link) *All About Animal Life Cycles* (Link)				*flowering plants. Assessment does not include details of human reproduction.]*				
CCC	**Patterns** ▪ Patterns of change can be used to make predictions. (3-LS1-1)	***FOSS Structures of Life*** **IG:** pp. 85, 90, 101, 104, 117, 119, 152, 162, 170 (Step 13), 173 **TR:** pp. D5-D8, D28-D29								

3-LS2 Ecosystems: Interactions, Energy, and Dynamics

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Construct an argument with evidence, data, and/or a model. (3-LS2-1)	***FOSS Structures of Life*** **IG:** pp. 188, 202, 244-245, 250, 268 (Step 14), 261 **TR:** pp. C27-C31, C44-C45				**3-LS2-1. Construct an argument that some animals form groups that help members survive.**	***FOSS Structures of Life*** **IG:** pp. 47, 51 **FOSS Assessment System** Embedded Assessment *Response Sheet* IG p. 257			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**LS2.D: Social Interactions and Group Behavior** ▪ Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (Note: Moved from K–2.) (3-LS2-1)	***FOSS Structures of Life*** **IG:** pp. 187, 191, 246 (Step 18), 248-249 (Steps 21-22), 249 (Step 23), 272 **SNM:** No. 21 **DOR:** *All About Animal Behavior and Communication* (Link) *Humphrey, the Lost Whale: A True Story* (Link)					SNM No. 23 Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 4-5 (Items 2-3)			
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1)	***FOSS Structures of Life*** **IG:** pp. 202, 242, 257, 260, 261, 270 **TR:** pp. D9-D11, D28-D29								

3-LS3 Heredity: Inheritance and Variation of Traits

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. ▪ Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)	***FOSS Structures of Life*** **IG:** pp. 146, 152, 158, 169, 280, 291, 301, 309, 320, 336 **TR:** pp. C18-C20, C40-C41				**3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.** [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [*Assessment*	***FOSS Structures of Life*** **IG:** pp. 47, 49, 51 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 309 (Step 10) Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 2-3 (Item 1) pp. 18-19 (Item 1ab) pp. 24-25 (Items 5-6)			
DCI	**LS3.A: Inheritance of Traits** ▪ Many characteristics of organisms are inherited from their parents. (3-LS3-1)	***FOSS Structures of Life*** **IG:** pp. 145, 147, 149, 151, 182, 272, 279, 281, 293, 309 (Step 9), 341								
DCI	**LS3.B: Variation of Traits** ▪ Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)	***FOSS Structures of Life*** **IG:** p. 283-284, 272, 283, 309 (Step 9 and 10), 310 (Step 10), 336 (Step 11), 341								
CCC	**Patterns** ▪ Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)	***FOSS Structures of Life*** **IG:** p. 152, 162, 173, 335 (Step 10)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
		TR: pp. D5-D8, D28-D29				*Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.*]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)	***FOSS Structures of Life*** **IG:** pp. 188, 190, 202, 230, 238, 244, 268, 270 **TR:** pp. C23-C31, C42-C43				**3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.** [Clarification Statement: Examples of the environment affecting a trait could include	***FOSS Structures of Life*** **IG:** pp. 47, 49, 51 **FOSS Assessment System** Embedded Assessment *Response Sheet* IG p. 257 SNM No. 23			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**LS3.A: Inheritance of Traits** ▪ Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)	***FOSS Structures of Life*** **IG:** pp. 187, 189, 194-195, 201, 203, 232 (Step 24), 233 (Step 26), 237 (Step 38), 272 **DOR:** "Walking Stick Survival" (Link)				normally tall plants grown with insufficient water are stunted; and a pet dog that is given too much food and little exercise may become overweight.]	Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 8-9 (Item 5ab) pp. 26-27 (Item 1ab) pp. 32-33 (Item 6)			
DCI	**LS3.B: Variation of Traits** ▪ The environment also affects the traits that an organism develops. (3-LS3-2)	***FOSS Structures of Life*** **IG:** pp. 187, 189, 194-195, 201, 203, 232 (Step 24), 233 (Step 26), 237 (Step 38), 272 **DOR:** "Walking Stick Survival" (Link)								
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)	***FOSS Structures of Life*** **IG:** pp. 202, 235 (Step 31), 242, 260, 261, 270 **TR:** pp. D9-D11, D28-D29								

3-LS4 Biological Evolution: Unity and Diversity

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. ▪ Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)	***FOSS Structures of Life*** **IG:** pp. 280, 291, 301, 309, 320, 336 **TR:** pp. C18-C20, C40-C41				**3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.** [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and	***FOSS Structures of Life*** **IG:** pp. 47, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Reading in Science Resources* IG p. 311 (Steps 17-18) IG p. 313 (Step 22) <u>Benchmark Assessment</u> ***FOSS Structures of Life* ACG** pp. 9-10 (Item 7) pp. 14-15 (Item 9)			
DCI	**LS4.A: Evidence of Common Ancestry and Diversity** ▪ Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: Moved from K–2.) (3-LS4-1) ▪ Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)	***FOSS Structures of Life*** **IG:** pp. 279, 281, 291, 293, 312 (Steps 20-21), 313 (Steps 22-23), 340-341 **SRB:** pp. 68-69, 81-88 **DOR:** *All About Fossils* (Link)								
CCC	**Scale, Proportion, and Quantity** ▪ Observable phenomena exist from very short to very long time periods. (3-LS4-1)	***FOSS Structures of Life*** **IG:** pp. 292, 310, 312 **TR:** pp. D12-D13, D30-D31								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	Connections to Nature of Science **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** ▪ Science assumes consistent patterns in natural systems. (3-LS4-1)	***FOSS Structures of Life*** **IG:** pp. 117 (Step 20), 235 (Step 31), 243 (Step 8), 313 **SRB:** pp. 79-80, 81-88 **SNM**: Nos. 20, 21 **DOR:** *All About Fossils* (Link)				fossils of extinct organisms.] [*Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.*]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2)	***FOSS Structures of Life*** **IG:** pp. 188, 190, 202, 230, 238, 244, 268, 270 **TR:** pp. C23-C31, C42-C43				**3-LS4-2.** **Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide**	***FOSS Structures of Life*** **IG:** pp. 47, 51 **FOSS Assessment System** Embedded Assessment *Answer the Focus Question*			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**LS4.B: Natural Selection** ▪ Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)	***FOSS Structures of Life*** **IG:** pp. 187, 189, 193-194, 201, 233 (Step 27), 272 **SNM**: Nos. 17-20 **DOR:** "Walking Stick Survival" (Link)				**advantages in surviving, finding mates, and reproducing.** [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]	IG p. 237 (Step 38) Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 12-13 (Item 8ab) Interim Assessment *Life Science Task 2—Walking Sticks*			
CCC	**Cause and Effect** • Cause and effect relationships are routinely identified and used to explain change. (3-LS4-2)	***FOSS Structures of Life*** **IG:** pp. 202, 235 (Step 31), 242, 260, 261, 270 **TR:** pp. D9-D11, D28-D29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Construct an argument with evidence. (3-LS4-3)	***FOSS Structures of Life*** **IG:** pp. 188, 190, 202, 244-245, 250 **TR:** pp. C27-C31, C44-C45				**3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.** [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]	***FOSS Structures of Life*** **IG:** pp. 47, 51 **FOSS Assessment System** Embedded Assessment IG p. 237 (Step 38) Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 16-17 (Item 12) pp. 34-35 (Item 1ab) pp. 36-37 (Item 2) pp. 38-39 (Item 4ab) pp. 40-41 (Item 5) Interim Assessment *Life Science Task 2—Walking Sticks*			
DCI	**LS4.C: Adaptation** ▪ For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)	***FOSS Structures of Life*** **IG:** pp. 187, 189, 191, 193-194, 201, 203, 247-248 (Steps 19-20), 272 **SNM**: Nos. 15, 16 **SRB:** pp. 42-49, 50-63 **DOR:** *All About Animal Adaptations* (Link) "Where Does It Live?" (Link) "What Doesn't Belong?" (Link)								
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified and used to explain change. (3-LS4-3)	***FOSS Structures of Life*** **IG:** pp. 202, 242 **TR:** pp. D9-D11, D28-D29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)	***FOSS Structures of Life*** **IG:** pp. 188, 202, 244-245, 250, 268 (Step 14), 261 **TR:** pp. C27-C31, C44-C45				**3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*** [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [*Assessment Boundary:*	***FOSS Structures of Life*** **IG:** pp. 47, 51 **FOSS Assessment System** Embedded Assessment IG p. 261 (Step 21) Benchmark Assessment ***FOSS Structures of Life* ACG** pp. 14-15 (Item 10) pp. 16-17 (Item 11) pp. 42-43 (Item 7)			
DCI	**LS2.C: Ecosystem Dynamics, Functioning, and Resilience** ▪ When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)	***FOSS Structures of Life*** **IG:** pp. 187, 260-261 (Steps 18-21), 268 (Step 14), 272 **SRB:** pp. 66-69 **DOR:** "Where Does It Live?" (Link) "What Doesn't Belong?" (Link) *All About Fossils* (Link)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**LS4.D: Biodiversity and Humans** ▪ Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)	***FOSS Structures of Life*** **IG:** pp. 187, 260-261 (Steps 18-21), 268 (Step 14), 272 **SRB:** pp. 66-69 **DOR:** "Where Does It Live?" (Link) "What Doesn't Belong?" (Link) *All About Fossils* (Link)				*Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.*]				
CCC	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (3-LS4-4)	***FOSS Structures of Life*** **IG:** pp. 224, 267, 268, 270 **TR:** pp. D14-D16, D30-D31								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Interdependence of Engineering, Technology and Applications of Science on Society and the Natural World** ▪ Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4-4)	***FOSS Structures of Life*** **IG:** pp. 325-327								

3-ESS2 Earth's Systems

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. ▪ Represent data in tables and various graphical displays (bar graphs, pictographs) to reveal patterns that indicate relationships. (3-ESS2-1)	***FOSS Water and Climate*** **IG:** pp. 192, 194, 201, 212, 213, 227, 228, 233, 253, 254, 259, 266, 267 **TR:** pp. C18-C20, C40-C41				**3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [*Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs.*	***FOSS Water and Climate*** **IG:** pp. 49, 51 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 212 (Step 13) IG p. 226 (Step 4) *Notebook Entry* IG p. 269 (Step 13) Benchmark Assessment ***FOSS Water and Climate* ACG** pp. 14-15 (Item 10) pp. 46-47 (Items 2-3) pp. 50-51 (Item 7) pp. 56-59 (Items 1ab-2) pp. 60-61 (Item 4)			
DCI	**ESS2.D: Weather and Climate** ▪ Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)	***FOSS Water and Climate*** **IG:** pp. 196, 200, 202-203, 207 (Step 9), 214-215 (Steps 18-19), 256, 259, 261 **SRB:** pp. 30-36 **DOR:** "Weather Grapher" (Link)								
CCC	**Patterns** ▪ Patterns of change can be used to make predictions. (3-ESS2-1)	***FOSS Water and Climate*** **IG:** pp. 201, 212, 213, 215, 222, 236, 260, 268, 269, 273, 277 **TR:** pp. D5-D8, D28-D29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
						Assessment does not include climate change.]	Interim Assessment *Earth Science Task 1—Seasons*			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. ▪ Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)	***FOSS Water and Climate*** **IG:** pp. 254, 259, 276, 283, 284 **TR:** pp. C32-C33, C46-C47				**3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.**	***FOSS Water and Climate*** **IG:** pp. 47, 51 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 277 (Step 16) Benchmark Assessment ***FOSS Water and Climate* ACG** pp. 12-13 (Item 9) pp. 18-19 (Item 12ab) pp. 62-63 (Item 5) pp. 64-65 (Item 7)			
DCI	**ESS2.D: Weather and Climate** ▪ Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)	***FOSS Water and Climate*** **IG:** pp. 253, 255, 256, 257, 259, 261, 272 (Step 1), 275 (Steps 11-12), 276 (Step 13) **SRB:** pp. 48-54 **DOR:** "Climate Regions Map" (Link)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
CCC	**Patterns** ▪ Patterns of change can be used to make predictions. (3-ESS2-2)	***FOSS Water and Climate*** **IG:** pp. 260, 268, 269, 273, 277 **TR:** pp. D5-D8, D28-D29					<u>Interim Assessment</u> *Earth Science Task 2—Climate*			

3-ESS3 Earth and Human Activity

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1)	***FOSS Water and Climate*** **IG:** pp. 292, 299, 319, 325 **TR:** pp. C27-C31, C44-C45				**3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*** [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers	***FOSS Water and Climate*** **IG:** pp. 47, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 285 (Step 16) <u>Benchmark Assessment</u> ***FOSS Water and Climate* ACG** pp. 58-59 (Item 3)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**ESS3.B: Natural Hazards** ▪ A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)	***FOSS Water and Climate*** **IG:** pp. 253, 255, 258, 259, 261, 284-285 (Steps 11-13) **SRB:** pp. 55-60, 61-62				to prevent flooding, wind resistant roofs, and lightning rods.]				
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)	***FOSS Water and Climate*** **IG:** pp. 260, 282, 284, 300, 307, 310 **TR:** pp. D9-D11, D28-D29								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3-ESS3-1)	***FOSS Water and Climate*** **IG:** pp. 284-285, 318-319, 328 **SRB:** pp. 55-60, 61-62, 73-76, 77-84, 86-89								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
CCC	***Connections to Nature of Science*** **Science is a Human Endeavor** ▪ Science affects everyday life. (3-ESS3-1)	***FOSS Water and Climate*** **IG:** pp. 208, 260, 284-285, 300 **SRB:** pp. 55-60, 61-62, 68-72, 75-76, 77-82								

3-PS2 Motion and Stability: Forces and Interactions

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-PS2-1)	***FOSS Motion and Matter*** **IG:** pp. 80, 85, 105, 124, 129, 151, 154, 200 **SNM:** No. 8 **TR:** pp. C14-C17, C38-C39				**3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.** [Clarification Statement: Examples could include	***FOSS Motion and Matter*** **IG:** pp. 49, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 106 (Step 6) *Response Sheet* IG p. 107 SNM No. 3			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** ▪ Science investigations use a variety of methods, tools, and techniques. (3-PS2-1)	***FOSS Motion and Matter*** **IG:** pp. 104-106, 136-138, 153-154 162-163, 182-184, 190-193, 227-229 **SRB:** pp. 8-9 **SNM:** No. 1				an unbalanced force on one side of a ball can make it start moving; and balanced forces pushing on a box from both sides will not produce any motion at all.] [*Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls*	Benchmark Assessment ***FOSS Motion and Matter* ACG** pp. 4-5 (Item 3) pp. 10-11 (Item 7) pp. 22-23 (Item 3ab) pp. 24-25 (Item 4ab) pp. 30-31 (Item 1abc)			
DCI	**PS2.A: Forces and Motion** ▪ Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1)	***FOSS Motion and Matter*** **IG:** pp. 79, 81, 83, 84-85, 87, 116 (Step 7), 117-118 (Steps 9-11), 119, 126-128, 129, 131, 166 **SRB:** pp. 3, 10-15, **DOR:** *All about Motion and Balance* (Link)								
DCI	**PS2.B: Types of Interactions** ▪ Objects in contact exert forces on each other. (3-PS2-1)	***FOSS Motion and Matter*** **IG:** pp. 84-85, 87, 116 (Step 7), 117-118 (Steps 9-11), 119 **SRB:** pp. 3-7 **DOR:** *All about Motion and Balance* (Link)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified. (3-PS2-1)	***FOSS Motion and Matter*** **IG:** pp. 86, 97, 99, 101, 109, 114, 137, 138, 144, 157, 165 **TR:** pp. D9-D11, D28-D29				*objects down*.]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2)	***FOSS Motion and Matter*** **IG:** pp. 80, 85, 96, 124, 129, 136, 143 **TR:** pp. C14-C17, C38-C39				**3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.** [Clarification Statement: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball	***FOSS Motion and Matter*** **IG:** pp. 49, 51, 53 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 155 (Step 13) *Notebook Entry* IG p. 139 (Step 17) *Response Sheet* IG p. 145 SNM Nos. 6-7			
SEP	***Connections to Nature of Science*** **Science Knowledge is Based on Empirical Evidence** ▪ Science findings are based on recognizing patterns. (3-PS2-2)	***FOSS Motion and Matter*** **IG:** pp. 138 (Step 13), 144 (Step 12), 202 (Step 11)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**PS2.A: Forces and Motion** ▪ The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2)	***FOSS Motion and Matter*** **IG:** pp. 123, 125, 126-127, 129, 131, 136 (Step 7), 142 (Step 4), 147 (Step 16), 154 (Steps 9-12), 166 **SRB:** pp. 16-21 **DOR:** "Roller Coaster Builder" (Link)				rolling back and forth in a bowl, and two children on a seesaw.] [*Assessment Boundary: Assessment does not include technical terms such as period and frequency*.]	Benchmark Assessment ***FOSS Motion and Matter* ACG** pp. 4-5 (Item 2) pp. 8-9 (Item 6ab) pp. 32-33 (Item 2) pp. 34-35 (Item 3ab) pp. 36-37 (Item 4ab) pp. 38-39 (Item 5) Interim Assessment *Physical Science Task 1—Swings*			
CCC	**Patterns** ▪ Patterns of change can be used to make predictions. (3-PS2-2)	***FOSS Motion and Matter*** **IG:** pp. 86, 106 (Step 4d), 143, 145, 146, 151 **TR:** pp. D5-D8, D28-D29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative	***FOSS Motion and Matter*** **IG:** pp. 79, 80, 85, 94, 105, 108 **SNM:** No. 2				**3-PS2-3. Ask questions to determine cause and effect relationships**	***FOSS Motion and Matter*** **IG:** pp. 49, 51 **FOSS Assessment System**			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	relationships. ▪ Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3)	**TR:** pp. C7-C10, C34-C35				**of electric or magnetic interactions between two objects not in contact with each other.** [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and	Embedded Assessment *Notebook Entry* IG p. 99 (Step 14) *Performance Assessment* IG p. 200 (Step 6) Benchmark Assessment ***FOSS Motion and Matter* ACG** pp. 2-3 (Item 1abc) pp. 18-19 (Item 1ab) pp. 20-21 (Item 2) pp. 26-27 (Item 5) pp. 28-29 (Item 6) Interim Assessment *Physical Science Task 1—Swings*			
DCI	**PS2.B: Types of Interactions** ▪ Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3)	***FOSS Motion and Matter*** **IG:** pp. 79, 81, 82, 84, 87, 98-99 (Step 12), 101 (Step 17), 116 (Step 7), 119 **SRB:** pp. 3-7 **SNM:** No. 2 **DOR:** "Magnetic Poles" (Link) *All about Magnets* (Link)								
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)	***FOSS Motion and Matter*** **IG:** pp. 86, 97, 99, 101, 109, 114 **TR:** pp. D9-D11, D28-D29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
						the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.] *[Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical*				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
						interactions are limited to static electricity.]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** ▪ Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4)	***FOSS Motion and Matter*** **IG:** pp. 172, 175, 176, 177, 199, 209, 211 **SRB:** pp. 42-45 **TR:** pp. C7-C10, C34-C35				**3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.*** [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]	***FOSS Motion and Matter*** **IG:** pp. 49, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 200 (Step 6) <u>Benchmark Assessment</u> ***FOSS Motion and Matter* ACG** pp. 28-29 (Item 6) <u>Interim Assessment</u> *Physical Science Task 2—Toy Shed*			
DCI	**PS2.B: Types of Interactions** ▪ Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-4)	***FOSS Motion and Matter*** **IG:** pp. 176, 177, 210 (Steps 11-12) **SRB:** pp. 42-45								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Interdependence of Science,**	***FOSS Motion and Matter*** **IG:** p. 203 (Steps 13-14) **SRB:** pp. 40-41, 42-								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	Engineering, and Technology ▪ Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3-PS2-4)	45								

3–5-ETS1 Engineering Design

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. ▪ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3–5-ETS1-1)	***FOSS Structures of Life*** **IG:** p.136 ***FOSS Water and Climate*** **IG:** pp. 325, 327 ***FOSS Motion and Matter*** **IG:** pp. 172, 175, 176, 177, 199, 200, 209, 211 **TR:** pp. C7-C10, C34-C35				**3–5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**	***FOSS Water and Climate*** **IG:** p. 51 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 325 (Step 8) ***FOSS Motion and Matter*** **IG:** p. 53			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**ETS1.A: Defining and Delimiting Engineering Problems** ▪ Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3–5-ETS1-1)	***FOSS Water and Climate*** **IG:** pp. 281-285, 323-328 **SRB:** pp. 55-60, 61-62 ***FOSS Motion and Matter*** **IG:** pp. 171, 173, 177, 179, 212 **SRB:** pp. 25-27, 28-33, 34-37					**FOSS Assessment System** <u>Benchmark Assessment</u> ***FOSS Motion and Matter* ACG** pp. 12-13 (Item 8ab) pp. 44-47 (Item 2abcd)			
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ People's needs and wants change over time, as do their demands for new and improved technologies. (3–5-ETS1-1)	***FOSS Water and Climate*** **IG:** p. 329 **SRB:** pp. 86-89								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing	***FOSS Structures of Life*** **IG:** pp. 137, 138 ***FOSS Water and Climate***				**3–5-ETS1-2. Generate and compare multiple possible solutions to a**	***FOSS Water and Climate*** **IG:** p. 51			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3–5-ETS1-2)	**IG:** p. 328 ***FOSS Motion and Matter*** **IG:** pp. 172, 178, 184, 193, 200, 202, 209, 211 **TR:** pp. C23-C31, C42-C43				**problem based on how well each is likely to meet the criteria and constraints of the problem.**	**FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 325 (Step 26) IG p. 330 (Step 8) Benchmark Assessment ***FOSS Water and Climate* ACG** pp. 2-3 (Item 1) pp. 62-63 (Item 6) ***FOSS Motion and Matter*** **IG:** p. 53 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 184 (Step 11) IG p. 193 (Step 16)			
DCI	**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) ▪ 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)	***FOSS Structures of Life*** **IG:** pp. 135 (Step 4), 136 (Step 12) **DOR:** *How Seed Get Here … and There* (Link) ***FOSS Water and Climate*** **IG:** pp. 324-328 ***FOSS Motion and Matter*** **IG:** pp. 171, 173, 177, 179, 212								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3–5-ETS1-2)	***FOSS Structures of Life*** **IG:** pp. 127, 338 **SRB:** pp. 12-15, 100-103 ***FOSS Water and Climate*** **IG:** pp. 308, 318-319 **SRB:** pp. 63-67, 73-76, 77-82, 86-89 ***FOSS Motion and Matter*** **IG:** p. 185 **SRB:** p. 24					Benchmark Assessment ***FOSS Motion and Matter* ACG** pp. 12-13 (Item 8ab) pp. 44-47 (Item 2abcd)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to	***FOSS Motion and Matter*** **IG:** pp. 172, 178, 182, 191, 200, 209 ***FOSS Water and Climate*** **IG:** pp. 225-227, 314-317 **SRB:** pp. 39-40				**3–5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a**	***FOSS Water and Climate*** **IG:** p. 51 **FOSS Assessment System** Embedded Assessment *Performance Assessment*			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3–5-ETS1-3)	**DOR:** "Virtual Investigation: Water Retention in Water" (Link) ***FOSS Structures of Life*** **IG:** pp. 242-245 **TR:** pp. C14-C17, C38-C39				**model or prototype that can be improved.**	IG p. 325 (Step 8) ***FOSS Motion and Matter*** **IG:** p. 53 **FOSS Assessment System** Benchmark Assessment ***FOSS Motion and Matter* ACG** pp. 12-13 (Item 8ab) pp. 40-41 (Item 1) pp. 44-47 (Item 2abcd)			
DCI	**ETS1.B: Developing Possible Solutions** ▪ Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3–5-ETS1-3)	***FOSS Water and Climate*** **IG:** pp. 291, 292, 299, 301, 325-328 ***FOSS Motion and Matter*** **IG:** pp. 171, 173, 177, 179, 212								
DCI	**ETS1.C: Optimizing the Design Solution** ▪ Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3–5-ETS1-3)	***FOSS Motion and Matter*** **IG:** pp. 171, 173, 177, 179, 212								

Standards Map for Kindergarten Through Grade Eight
Grade 4– California Next Generation Science Standards

4-LS1 From Molecules to Organisms: Structures and Processes

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Construct an argument with evidence, data, and/or a model. (4-LS1-1)	***FOSS Environments*** **IG:** pp. 125, 129, 154, 161, 189, 263, 282, 291, 312, 313 **TR:** pp. C27-C31, C54-C55				**4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. ****Each**	***FOSS Environments*** **IG:** pp. 47, 49, 51 **FOSS Assessment System** <u>Embedded Assessment</u> *Response Sheet* IG p. 211 SNM Nos. 12-13 <u>Benchmark Assessment</u> ***FOSS Environments* ACG** pp. 2-3 (Items 1-2) pp. 4-5 (Item 3) pp. 8-9 (Item 7) pp. 16-17 (Item1a) pp. 18-19 (Item 3) pp. 20-21 (Item 5)			
DCI	**LS1.A: Structure and Function** ▪ Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)	***FOSS Environments*** **IG:** pp. 126 (Steps 27-28), 153, 155, 160, 163, 185 (Step 25), 262 (Step 15), 273, 311 (Steps 48-49) **SRB:** pp. 16-17, 91-92 **DOR:** "Virtual Investigation: Trout Range of Tolerance"								

Publisher: Delta Education
Program Title: FOSS Next Generation Elementary
Components: Investigations Guide (IG), Science Resources Book (SRB), Digital-Only Resources (DOR), Teacher Resources Book (TR), Science Notebook Masters (SNM), Teacher Masters (TM), Assessment Coding Guide (ACG)

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
		(Link)				**structure has specific functions within its associated system.**] [*Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.*]	pp. 22-23 (Item 6) pp. 28-29 (Item 1b) pp. 34-35 (Item 6) pp. 40-41 (Item 1d) pp. 46-47 (Item 6) pp. 48-49 (Items 2ab) Interim Assessment *Life Science Task 1—Structure Function*			
CCC	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (4-LS1-1)	***FOSS Environments*** **IG:** pp. 128, 141, 183, 186, 239, 269 **TR:** pp. D15-D17, D32-D33								

California Department of Education

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)	***FOSS Environments*** **IG:** pp. 127, 153, 154, 180, 196, 201, 210 **TR:** pp. C11-C13, C34-C37				**4-LS1-2.** **Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond**	***FOSS Environments*** **IG:** pp. 47, 49, 51 **FOSS Assessment System** Embedded Assessment IG pp. 212-213 (Step 22)			
DCI	**LS1.D: Information Processing** ▪ Different sense receptors are specialized for particular kinds of information, which may be then	***FOSS Environments*** **IG:** pp. 145, 101 (Step 6), 208-209								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)	(Step 13), 210-211 (Step 17), 212 (Steps 20-22), 215 **SRB:** pp. 17, 48-54 **DOR:** *Animal Language and Communication* (Link) *Sense of Hearing* (Link)				**to the information in different ways.** [Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]	Benchmark Assessment ***FOSS Environments* ACG** pp. 6-7 (Items 5-6) pp. 8-9 (Item 8) pp. 18-19 (Item 3) pp. 24-25 (Items 7-8) pp. 32-33 (Item 4) Interim Assessment *Life Science Task 2—Star Nosed Mole*			
CCC	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (4-LS1-2)	***FOSS Environments*** **IG:** pp. 128, 141, 162, 170, 183, 186, 197 **TR:** pp. D15-D17, D32-D33								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Identify the evidence that supports particular points in an explanation. (4-ESS1-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 166, 175, 176, 178, 182, 188, 196, 248, 253, 254 **TR:** pp. C23-C26, C46-C53				**4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock formations and fossils in rock layers for changes in a landscape over time to support an explanation for changes in a landscape over time.** [Clarification Statement: Examples of evidence from patterns could include rock layers with shell fossils above rock layers with plant fossils and no shells,	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 51, 53, 55 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 180 (Step 23) *Notebook Entry* IG p. 197 (Step 15) <u>Benchmark Assessment</u> ***FOSS Soils, Rocks, and Landforms* ACG** pp. 12-13 (Item 8) pp. 18-19 (Item 1ab) pp. 22-23 (Item 4) pp. 30-31 (Items 1ab) pp. 32-33 (Item 2)			
DCI	**ESS1.C: The History of Planet Earth** ▪ Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (4-ESS1-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 194-195 (Steps 5-6), 198-199 (Steps 16-18), 199-200 (Steps 20-23), 258 **SRB:** pp. 23-26, 27-30 **DOR:** *Fossils* (Link) "Tutorial: Fossils" (Link)								
CCC	**Patterns** ▪ Patterns can be used as evidence to support an explanation. (4-ESS1-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp.156, 164, 188, 216, 244								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
		TR: pp. D6-D9, D28-D29				indicating a change from land to water over time; and a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.] [*Assessment Boundary: Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.*]	Interim Assessment *Earth Science Task 1—Changing Landscapes*			
CCC	***Connections to Nature of Science*** ***Scientific Knowledge Assumes an Order and Consistency in Natural Systems*** ▪ Science assumes consistent patterns in natural systems. (4-ESS1-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 102, 105, 127, 139, 164, 188, 244								

4-ESS2 Earth's Systems

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (4-ESS2-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 103, 114, 124, 139, 163, 175, 176, 179. 182 (Step 28), 187 **TR:** pp. C14-C17, C38-C41 **DOR:** "Virtual Investigation: Stream Tables" (Link)				**4-ESS2-1.** **Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.** [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [*Assessment Boundary: Assessment is limited to a single form of weathering or erosion.]*	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 51, 53 **FOSS Assessment System** Embedded Assessment *Observation* IG p. 114 (Step 6) *Response Sheet* IG p. 118 SNM No. 3 *Performance Assessment* IG p. 124 (Step 7) IG p. 180 (Step 23) Benchmark Assessment ***FOSS Soils, Rocks, and Landforms* ACG** pp. 12-13 (Item 8)			
DCI	**ESS2.A: Earth Materials and Systems** ▪ Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 124, 129-130 (Steps 18-21), 131-132 (Step 23), 142, 168-169 (Steps 18-20), 181 (Step 27), 182 (Step 28), 201								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	and move them around. (4-ESS2-1)	**SRB:** pp. 6-8, 9-14 **DOR:** *Weathering and Erosion* (Link) "Tutorial: Weathering" (Link)					pp. 18-19 (Items 1ab) pp. 22-23 (Item 4) pp. 30-31 (Items 1ab) pp. 32-33 (Item 2) Interim Assessment *Earth Science Task 2—Erosion*			
DCI	**ESS2.E: Biogeology** ▪ Living things affect the physical characteristics of their regions. (4-ESS2-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 89, 92-93, 101 (Step 3), 142 **SRB:** pp. 4-5 **DOR:** *Soils* (Link) "Tutorial: Soil Formation" (Link)								
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified, tested, and used to explain change. (4-ESS2-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 114, 117, 119, 124, 127, 128, 133, 164, 166, 169, 175, 177, 178, 187, 189, 195, 196 **TR:** pp. D10-D12, D28-D31								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 164, 176, 180, 233, 236, 237,				**4-ESS2-2. Analyze and interpret data from maps to**	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 51, 53			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. ▪ Analyze and interpret data to make sense of phenomena using logical reasoning. (4-ESS2-2)	244, 253 **TR:** pp. C18-C20, C40-C45				**describe patterns of Earth's features.** [Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.]	**FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 180 (Step 23) IG p. 245 (Step 5) Benchmark Assessment ***FOSS Soils, Rocks, and Landforms* ACG** pp. 6-7 (Items 4ab) pp. 16-17 (Items 11ab) pp. 42-43 (Items 1abc) pp. 48-49 (Item 6)			
DCI	**ESS2.B: Plate Tectonics and Large-Scale System Interactions** ▪ The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth. (4-ESS2-2)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 227 (Steps 21-23), 239 (Step 16), 240 (Step 18), 256 (Steps 9-11), 258 **SRB:** pp. 31-33, 38-49 **DOR:** *Volcanoes* (Link) "Topographer" (Link)								
CCC	**Patterns** ▪ Patterns can be used as evidence to support an explanation. (4-ESS2-2)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 164, 180, 188, 244 **TR:** pp. D6-D9, D28-D29								

4-ESS3 Earth and Human Activity

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluate the merit and accuracy of ideas and methods. ▪ Obtain and combine information from books and other reliable media to explain phenomena. (4-ESS3-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 277, 279, 280, 281, 282, 291, 299 **TR:** pp. C32-C33, C56-C61				**4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.** [Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials.	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 51, 55 **FOSS Assessment System** Embedded Assessment *Response Sheet* IG p. 280 SNM No. 18 *Notebook Entry* IG p. 291 (Step 15) Benchmark Assessment ***FOSS Soils, Rocks, and Landforms* ACG** pp. 8-9 (Item 6)			
DCI	**ESS3.A: Natural Resources** ▪ Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (4-ESS3-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 268-270, 278 (Step 6), 283 (Step 15), 301 **DOR:** *Natural Resources* (Link) "Resource ID" (Link) "Virtual Investigation: Natural Resources" (Link)								
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified and used to explain change. (4-ESS3-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 277 (Step 2), 290 **TR:** pp. D10-D12, D28-D31								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Interdependence of Science, Engineering, and Technology** ▪ Knowledge of relevant scientific concepts and research findings is important in engineering. (4-ESS3-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 282 (Steps 12-14) and 289 (9-11) **SRB:** pp. 55-59, 60-64				Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.]				
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Over time, people's needs and wants change, as do their demands for new and improved technologies. (4-ESS3-1)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 281 (Steps 10-11) and 289 (9-11) **SRB:** pp. 50-54, 60-64								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Generate and compare multiple solutions to a problem based on	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 207, 208, 215, 248, 253, 254 **TR:** pp. C23-C26, C46-C53				**4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*** [Clarification	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 51, 55 **FOSS Assessment System** Embedded Assessment *Notebook Entry*			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	how well they meet the criteria and constraints of the design solution. (4-ESS3-2)					Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.] [*Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.*]	IG p. 255 (Step 9) Benchmark Assessment ***FOSS Soils, Rocks, and Landforms* ACG** pp. 14-15 (Items 9-10) pp. 50-51 (Items 7ab)			
DCI	**ESS3.B: Natural Hazards** ▪ A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts. (4-ESS3-2) (Note: This Disciplinary Core Idea can also be found in 3.WC.)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 212-213, 217, 239 (Step 16), 240 (Step 18), 254-255 (Step 6), 258 **DOR:** *Volcanoes* (Link) *All About Earthquakes* (Link)								
DCI	**ETS1.B: Designing Solutions to Engineering Problems** ▪ Testing a solution involves investigating how well it performs under a range of likely conditions. (secondary to 4-ESS3-2)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 225, 232-235, 254-255 (Steps 6-9), 258								
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified, tested, and used to explain change. (4-ESS3-2)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 216, 253, 254 **TR:** pp. D10-D12, D28-D31								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering,**	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 232-235, 246 (Step 6), 265, 271, 282 (Steps 12-14),								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	Technology, and Science on Society and the Natural World ▪ Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands. (4-ESS3-2)	290 **SRB:** pp. 50-54, 55-59 **DOR:** *Mt. St. Helens Impact* (Link)								

4-PS3 Energy

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (4-PS3-1)	***FOSS Energy*** **IG:** pp. 303, 304, 306 (Step 20), 314, 321 **TR:** pp. C23-C26, C46-C53				**4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. [**Clarification Statement: Examples of**	***FOSS Energy*** **IG:** pp. 59, 63 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 304 (Step 15) *Response Sheet* IG p. 315			

Publisher: Delta Education
Program Title: FOSS Next Generation Elementary
Components: Investigations Guide (IG), Science Resources Book (SRB), Digital-Only Resources (DOR), Teacher Resources Book (TR), Science Notebook Masters (SNM), Teacher Masters (TM), Assessment Coding Guide (ACG)

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
DCI	**PS3.A: Definitions of Energy** ▪ The faster a given object is moving, the more energy it possesses. (4-PS3-1)	***FOSS Energy*** **IG:** pp. 301 (Step 5), 303 (Step 11), 304 (Step 15), 314 (Step 13), 320 (Step 26), 321				**evidence relating speed and energy could include change of shape on impact or other results of collisions.]** [Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.]	SNM No. 25 <u>Benchmark Assessment</u> ***FOSS Energy* ACG** pp. 12-13 (Item 8) pp. 54-55 (Items 2ab) pp. 56-57 (Item 3) pp. 62-63 (Item 9) <u>Interim Assessment</u> *Physical Science Task 1—Speed and Energy*			
CCC	**Energy and Matter** ▪ Energy can be transferred in various ways and between objects. (4-PS3-1)	***FOSS Energy*** **IG:** pp. 277, 286, 293, 295, 314, 321, 322 **TR:** pp. D18-D20, D34-D35								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out**	***FOSS Energy***				**4-PS3-2.**	***FOSS Energy***			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)	**IG:** pp. 121, 138, 140, 152, 153, 246, 302, 311, 312 **TR:** pp. C14-C17, C38-C41				**Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.** [Assessment Boundary: Assessment does not include quantitative measurements of energy.]	**IG:** pp. 59, 61, 63 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 255 (Step 6) IG p. 293 (Step 10) Benchmark Assessment ***FOSS Energy* ASG** pp. 8-9 (Item 4) pp. 22-23 (Items 4-5) pp. 24-25 (Item 6) pp. 26-27 (Items 7-8) pp.56- 57 (Item 4) pp. 58-59 (Item 5) pp. 62-63 (Item 9)			
DCI	**PS3.A: Definitions of Energy** ▪ Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-2)	***FOSS Energy*** **IG:** pp. 123 (Step 10), 126 (Step 18), 164, 169, 271, 294-295 (Steps 13-15), 321 **SRB:** pp. 65-73 **DOR:** "Lighting a Bulb" (Link) "Flow of Electric Current" (Link)								
DCI	**PS3.B: Conservation of Energy and Energy Transfer** ▪ Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be	***FOSS Energy*** **IG:** pp. 127-128 (Steps 19-21), 164, 169, 271, 293, 296 (Step 16), 314 (Step 13), 316 (Steps 17-								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (4-PS3-2) ▪ Light also transfers energy from place to place. (4-PS3-2) ▪ Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (4-PS3-2)	19), 320 (Step 26), 321, 368-369 (Steps 22-24) **SRB:** pp. 3-7, 100-105 **DOR:** *All About Transfer of Energy* (Link) "Reflecting Light" (Link)								
CCC	**Energy and Matter** ▪ Energy can be transferred in various ways and between objects. (4-PS3-2)	***FOSS Energy*** **IG:** pp. 125, 129, 137, 139, 142, 156, 248, 260, 295, 314 **TR:** pp. D18-D20, D34-D35								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining**	***FOSS Energy***				**4-PS3-3.**	***FOSS Energy***			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	Problems Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. ▪ Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3)	**IG:** pp. 285, 315, 338, 381 **TR:** pp. C7-C10, C34-C35				**Ask questions and predict outcomes about the changes in energy that occur when objects collide.** [Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact.] [Assessment Boundary: Assessment does not include quantitative measurements of energy.]	**IG:** pp. 59, 63, 65 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 293 (Step 10) *Response Sheet* IG p. 315 SNM No. 25 <u>Benchmark Assessment</u> ***FOSS Energy* ASG** pp. 2-3 (Items 1ab) pp. 4-5 (Items 2ab) pp. 58-59 (Item 6) pp. 60-61 (Item 7) pp. 62-63 (Item 8) <u>Interim Assessment</u> *Physical Science Task 1—Speed and Energy*			
DCI	**PS3.A: Definitions of Energy** ▪ Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-3)	***FOSS Energy*** **IG:** pp. 303 (Step 11), 318-319 (Steps 23-25), 321, 384 **SRB:** pp. 83-85								
DCI	**PS3.B: Conservation of Energy and Energy Transfer** ▪ Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (4-PS3-3)	***FOSS Energy*** **IG:** pp. 293, 314 (Step 13), 316 (Steps 17-19), 321, 384 **SRB:** p. 78								
DCI	**PS3.C: Relationship Between Energy and Forces** ▪ When objects collide, the	***FOSS Energy*** **IG:** pp. 305-306								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	contact forces transfer energy so as to change the objects' motions. (4-PS3-3)	(Steps 17-19), 317-318 (Steps 20-22), 320 (Step 26), 321 **SRB:** pp. 74-77, 79-82 **DOR:** *All About Transfer of Energy* (Link)								
CCC	**Energy and Matter** ▪ Energy can be transferred in various ways and between objects. (4-PS3-3)	***FOSS Energy*** **IG:** pp. 295, 314, 351, 352, 366 **TR:** pp. D18-D20, D34-D35								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Apply scientific ideas to solve design problems. (4-PS3-4)	***FOSS Energy*** **IG:** pp. 124, 126, 141, 249, 264, 266, 303, 304, 314, 357, 363 **TR:** pp. C23-C26, C46-C53				**4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*** [Clarification Statement: Examples of	***FOSS Energy*** **IG:** pp. 59, 61, 63, 65 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 126 (Step 17) *Response Sheet*			
DCI	**PS3.B: Conservation of Energy and Energy Transfer**	***FOSS Energy*** **IG:** pp. 127-128								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	▪ Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (4-PS3-4)	(Steps 19-21), 165 (Step 10), 169, 271, 293, 321, 384 **SRB:** pp. 3-7 **DOR: "**Conductor Detector*"* (Link)				devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.] [Assessment Boundary: Devices should be limited to those that convert motion energy to electric energy or use stored energy to cause motion or produce light	IG p. 156 SNM No. 7 *Performance Assessment* IG p. 255 (Step 6) IG p. 293 (Step 10) IG p. 381 (Step 18) *Review* IG p. 351 (Step 13) Benchmark Assessment ***FOSS Energy* ASG** pp. 2-3 (Items 1ab) pp. 4-5 (Items 2ab) pp. 58-59 (Item 6) pp. 60-61 (Item 7) pp. 62-63 (Item 8)			
DCI	**PS3.D: Energy in Chemical Processes and Everyday Life** ▪ The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. (4-PS3-4)	***FOSS Energy*** **IG:** pp. 120 (Step 2), 169, 271, 321, 384								
DCI	**ETS1.A: Defining Engineering Problems** ▪ Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes	***FOSS Energy*** **IG:** pp. 167 (Steps 13-14), 168 (Step 15), 169, 384 **SRB:** pp. 21-24, 25-29								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	the constraints into account. (secondary to 4-PS3-4)					or sound.]				
CCC	**Energy and Matter** ▪ Energy can be transferred in various ways and between objects. (4-PS3-4)	***FOSS Energy*** **IG:** pp. 125, 129, 137, 139, 142, 156, 248, 260, 295, 314, 352, 366 **TR:** pp. D18-D20, D34-D35								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Engineers improve existing technologies or develop new ones. (4-PS3-4)	***FOSS Energy*** **IG:** pp. 112, 164-165, 264-266 **SRB:** pp. 58-64, 114-118								
CCC	***Connections to Nature of Science*** **Science is a Human Endeavor** ▪ Most scientists and engineers work in teams. (4-PS3-4) ▪ Science affects everyday life. (4-PS3-4)	***FOSS Energy*** **IG:** pp. 165 (Step 7), 167 (Steps 13-14), 168 (Step 15), 269 (Step 17) **SRB:** pp. 21-24, 25-29								

4-PS4 Waves and their Applications in Technologies for Information Transfer

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Develop a model using an analogy, example, or abstract representation to describe a scientific principle. (4-PS4-1)	***FOSS Energy*** **IG:** pp. 338, 347, 361, 365 **TR:** pp. C11-C13, C34-C37				**4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.** [Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [*Assessment Boundary: Assessment does not include interference*	***FOSS Energy*** **IG:** pp. 59, 65 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 352 (Step 18) Benchmark Assessment ***FOSS Energy* ASG** pp. 6-7 (Items 3ab)			
SEP	***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** ▪ Science findings are based on recognizing patterns. (4-PS4-1)	***FOSS Energy*** **IG:** pp. 346, 347, 351, 352, 357								
DCI	**PS4.A: Wave Properties** ▪ Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets the beach. (Note: This grade band endpoint was moved from K–2.) (4-PS4-1) ▪ Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)	***FOSS Energy*** **IG:** pp. 341, 348-349 (Steps 10-11), 351-352 (Steps 14-16), 353-355 (Steps 19-22), 384 **SRB:** pp. 86-90 **DOR:** *All About Waves* (Link)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
CCC	**Patterns** ▪ Similarities and differences in patterns can be used to sort, classify and analyze simple rates of change for natural phenomena. (4-PS4-1)	***FOSS Energy*** **IG:** pp. 346, 347, 351, 352, 357 **TR:** pp. D6-D9, D28-D29				*effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.]*				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Develop a model to describe phenomena. (4-PS4-2)	***FOSS Energy*** **IG:** pp. 338, 347, 361, 365 **TR:** pp. C11-C13, C34-C37				**4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.** *[Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular*	***FOSS Energy*** **IG:** pp. 59, 65 **FOSS Assessment System** Embedded Assessment *Response Sheet* IG p. 367 SNM No. 28 Benchmark Assessment ***FOSS Energy* ASG** pp. 8-9 (Item 5) pp. 10-11 (Item 7) Interim Assessment			
DCI	**PS4.B: Electromagnetic Radiation** ▪ An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)	***FOSS Energy*** **IG:** pp. 361 (Step 1), 363 (Step 9), 366 (Step 17), 369-370 (Steps 25-27), 384 **SRB:** pp. 106-110 **DOR:** *All About Light* (Link)								
CCC	**Cause and Effect** Cause and effect relationships are routinely identified.	***FOSS Energy*** **IG:** pp. 346, 347, 351, 352, 357, 363,								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
		371, 378 **TR:** pp. D10-D12, D28-D31				*mechanisms of vision, or how the retina works*.]	*Physical Science Task 2—Hide and Seek*			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-PS4-3)	***FOSS Energy*** **IG:** pp. 249, 255, 264, 266 **TR:** pp. C23-C26, C46-C53				**4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.*** [Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information	***FOSS Energy*** **IG:** pp. 59, 63 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 20 SNM No. 21 Benchmark Assessment ***FOSS Energy* ASG** pp. 12-13 (Item 9) pp. 50-51 (Item 9)			
DCI	**PS4.C: Information Technologies and Instrumentation** ▪ Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode	***FOSS Energy*** **IG:** pp. 269 (Step 17), 267-268 (Steps 13-15), 271 **SRB:** pp. 58-64								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	information—convert it from digitized form to voice—and vice versa. (4-PS4-3)					about a picture, and using Morse code to send text.]				
DCI	**ETS1.C: Optimizing the Design Solution** Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (secondary to 4-PS4-3)	***FOSS Energy*** **IG:** pp. 169, 265 (Step 5), 270 (Step 19), 271, 384								
CCC	**Patterns** ▪ Similarities and differences in patterns can be used to sort and classify designed products. (4-PS4-3)	***FOSS Energy*** **IG:** pp. 240, 255, 266 (Step 8) **TR:** pp. D6-D9, D28-D29								
CCC	***Connections to Engineering, Technology, and Applications of Science*** **Interdependence of Science, Engineering, and Technology** ▪ Knowledge of relevant scientific concepts and research findings is important in engineering. (4-PS4-3)	***FOSS Energy*** **IG:** pp. 250-251 (17-19), 259 (Step 16), 266 (Step 12) **SRB:** pp. 44-46, 49-57								

3–5-ETS1 Engineering Design

Science and Engineering Practices Disciplinary Core Ideas	Publisher Citations	Meets Standard	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard	Reviewer Comments, Citations, and

Crosscutting Concepts			Y	N				Y	N	Questions
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. ▪ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3–5-ETS1-1)	***FOSS Energy*** **IG:** pp. 163, 164, 168, 381 **TR:** pp. C7-C10, C34-C35				**3–5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**	***FOSS Energy*** **IG:** pp. 59, 61, 65 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* **IG:** p. 164 (Step 4) **IG:** p. 381 (Step 18) <u>Benchmark Assessment</u> ***FOSS Energy* ASG** pp. 46-47 (Item 7)			
DCI	**ETS1.A: Defining and Delimiting Engineering Problems** ▪ Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3–5-ETS1-1)	***FOSS Energy*** **IG:** pp. 163-164 (Step 3), 169, 379 (Step 13), 381, 384								
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World**	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 289-290								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	▪ People's needs and wants change over time, as do their demands for new and improved technologies. (3–5-ETS1-1)	(Steps 9-12) **SRB:** pp. 60-64 ***FOSS Energy*** **IG:** pp. 382-383 (Steps 22-24), 282 (Step 25) **SRB:** pp. 114-119, 120-121								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3–5-ETS1-2)	***FOSS Soils, Rocks, and Landforms*** **IG:** pp. 248, 291, 296, 297 ***FOSS Energy*** **IG:** p. 391 **TR:** pp. C23-C26, C46-C53				**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.**	***FOSS Energy*** **IG:** pp. 59, 61, 65 **FOSS Assessment System** <u>Embedded Assessment</u> *Performance Assessment* IG p. 381 (Step 18) <u>Benchmark Assessment</u> ***FOSS Energy* ASG** pp. 18-19 (Item 2a)			
DCI	**ETS1.B: Developing Possible Solutions** ▪ Research on a problem should be carried out before beginning to design a solution. Testing a	***FOSS Energy*** **IG:** pp. 163-164 (Step 3),169, 380-381 (Step 17), 384								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	solution involves investigating how well it performs under a range of likely conditions. (3–5-ETS1-2) ▪ 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)									
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3–5-ETS-2)	***FOSS Energy*** **IG:** pp. 246-249 **SRB:** pp. 58-64, 114-118								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5	***FOSS Energy*** **IG:** pp. 163 (Step 3), 215-220, 254-256 **TR:** pp. C14-C17,				**3–5-ETS1-3. Plan and carry out fair tests in which variables are**	***FOSS Energy*** **IG:** pp. 59, 61, 63, 65 **FOSS Assessment**			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
	builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3–5-ETS1-3)	C38-C41				**controlled and failure points are considered to identify aspects of a model or prototype that can be improved.**	**System** Embedded Assessment *Performance Assessment* IG p. 381 (Step 18) Benchmark Assessment ***FOSS Energy* ASG** pp. 18-19 (Item 2a)			
DCI	**ETS1.B: Developing Possible Solutions** ▪ Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3–5-ETS1-3)	***FOSS Energy*** **IG:** pp. 163-166, 169, 377-381, 384								
DCI	**ETS1.C: Optimizing the Design Solution** ▪ Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3–5-ETS1-3)	***FOSS Energy*** **IG:** pp. 163-166, 169, 246-249, 269-270, 271, 377-381, 384								

Standards Map for Kindergarten Through Grade Eight
Grade 5 – California Next Generation Science Standards

5-LS1 From Molecules to Organisms: Structures and Processes

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard Y	Meets Standard N	Reviewer Comments, Citations, and Questions
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Support an argument with evidence, data, or a model. (5-LS1-1)	***FOSS Living Systems*** **IG:** pp. 172, 190, 193 **TR:** pp. C27-C32, C50-C53				**5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.** [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]	***FOSS Living Systems*** **IG:** pp. 47, 51, 53 **FOSS Assessment System** Benchmark Assessment ***FOSS Living Systems* ACG** pp. 2-3 (Item 1a) pp. 12-13 (Item 7) pp. 30-31 (Item 1) pp. 32-33 (Item 2) pp. 40-41 (Item 9) pp. 42-43 (Item 1a) pp. 44-45 (Item 1b) pp. 46-47 (Item 3) pp. 50 -51 (Item 5) Interim Assessment *Life Science Task 1—Plant Growth*			
DCI	**LS1.C: Organization for Matter and Energy Flow in Organisms** ▪ Plants acquire their material for growth chiefly from air and water. (5-LS1-1)	***FOSS Living Systems*** **IG:** pp. 171-173 (Steps 7-9), 173 (Step 11), 223 (Step 28), 225-226 (Steps 30-33) **SRB**: pp. 23-26, 40-42, 74, 77 **DOR:** *Plant Structure and Growth* (Link) "Plant Vascular System" (Link)								

CCC	**Energy and Matter** ▪ Matter is transported into, out of, and within systems. (5-LS1-1)	***FOSS Living Systems*** **IG:** pp. 172, 173 193, 210, 229, 257, 272, 313 **SRB:** pp. 23 and 26 **TR:** pp. D19-D21, D38-D41								

5-LS2 Ecosystems: Interactions, Energy, and Dynamics

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 models and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Develop a model to describe phenomena. (5-LS2-1)	***FOSS Living Systems*** **IG:** pp. 88, 113, 115, 122, 123, 137, 151, 165, 176, 193, 209, 237, 240, 242, 257 **TR:** pp. C11-C13, C36-C39				**5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** [Clarification Statement: Emphasis is on the idea that matter that is not food (air,	***FOSS Living Systems*** **IG:** pp. 49, 51, 53, 55 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 102 (Step 13) IG p. 116 (Step 29) IG p. 230 (Step 40) *Performance Assessment*			
SEP	***Connections to Nature of Science*** **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** ▪ Science explanations describe the mechanisms for natural events. (5-LS2-1)	***FOSS Living Systems*** **IG:** pp. 114-115 (Step 26), 122, 172, 224, 241, 244, 265, 269 **SRB:** pp. 78-80								

DCI	**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 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)	***FOSS Living Systems*** **IG**: pp. 79, 81, 83-84, 90-91, 110-113,121 (Step 4), 122, 123, 125 (Step 17), 126 (Step 20), 130, 150-151, 162 (Step 19), 192 (Step 24), 312 (Step 4) **SRB:** pp. 7-10, 14-15,16, 17, 18-20, 26, 27, 29-31, 71, 74-77 **DOR:** *Food Chains* (Link) *Marine Ecosystems* (Link) *Web of Life: Life in the Sea* (Link) "Food Webs" (Link)				water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [*Assessment Boundary: Assessment does not include molecular explanations*.]	IG p. 132 (Step 6) IG p. 249 (Step 4) *Response Sheet* IG p. 123 SNM No. 4 IG p. 243 SNM No. 16 <u>Benchmark Assessment</u> ***FOSS Living Systems* ACG** pp. 4-5 (Items 1bd) pp. 6-7 (Item 3) pp. 8-9 (Items 4 and 5) pp. 14-15 (Item 10) pp. 18-19 (Items 1ab and 2) pp. 20-21 (Item 4) pp. 22-23 (Items 5ab) pp. 26-27 (Items 8ab) pp. 32-33 (Item 3) pp. 34-35 (Item 4) pp. 36-37 (Item 7) pp. 38-39 (Item 8) pp. 44-45 (Item 2) pp. 48-49 (Item 4) pp. 50-51 (Items 6			
DCI	**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.	***FOSS Living Systems*** **IG:** pp. 79, 81, 83, 125 (Step 17), 137, 150-151, 157 (Step 3), 161 (Step 15),								

	Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)	172 (Step 9), 208-209, 223 (Step 28), 224 (Step 29), 254 (Steps 12 and 15), 311 (Step 1), 312 (Step 4), 315, 316 **SRB:** pp. 17, 18-20, 24-25, 28, 36, 40-41, 48-53, 54-55, 56-57 **DOR:** *Circulatory and Respiratory Systems* (Link) "Plant Vascular System" (Link)					and 7) pp. 52-53 (Item 8) Interim Assessment *Life Science Task 2—Penguins*			
CCC	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (5-LS2-1)	***FOSS Living Systems*** **Module driving question:** How can we describe Earth's biosphere as a system of interacting parts? (p.317) **IG:** pp. 99, 102, 122, 132, 162, 173, 184, 229, 230, 240, 242, 311, 312, 313, 316 **SRB:** pp. 3-4, 5-6, 11, 40, 42, 50, 54-55, 56-57, 62-63 **DOR:** *Circulatory and Respiratory Systems* (Link) *Digestive and Excretory System*								

		(Link) *The Brain and the Nervous System* (Link) **TR:** pp. D16-D18, D34-D37									

5-ESS1 Earth's Place in the Universe

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Support an argument with evidence, data, or a model. (5-ESS1-1)	***FOSS Earth and Sun*** **IG:** pp. 167, 177, 189, 217 ***FOSS Earth and Sun*** **SRB:** pp. 20-24 **TR:** pp. C27-C32, C50-C53				**5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. [**Clarification Statement: Absolute brightness of stars is the result of a variety of factors. Relative**	***FOSS Earth and Sun*** **IG:** pp. 57, 59 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 182 (Step 18) IG 229 (Step 15) Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 4-5 (Items 3ab) pp. 32-33 (Item 5) pp. 34-35 (Item 6)			
DCI	**ESS1.A: The Universe and its Stars** ▪ The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)	***FOSS Earth and Sun*** **IG:** pp. 151, 154, 155, 165-166, 169-70, 177-178 (Step 9), 181 (Step 16), 182, 185, 190-191 (Step 8), 194 (Step 15), 223 (Step 2), 228 (Step 13), 230 (Step								

		17), 231 (Step 20), 233 **SRB:** pp. 15, 22, 48-49, 66-67, 70, 78 **DOR:** *All about the Stars* (Link)				**distance from Earth is one factor that affects apparent brightness and is the one selected to be addressed by the performance expectation.]** [*Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage*).]	Interim Assessment *Earth Science Task 1—Star Brightness*			
CCC	**Scale, Proportion, and Quantity** ▪ Natural objects exist from the very small to the immensely large. (5-ESS1-1)	***FOSS Earth and Sun*** **IG:** pp. 168, 181, 188, 189, 190, 191, 194, 233 **TR:** pp. D13-D15, D32-D33								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Analyzing and Interpreting Data** Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. ▪ Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)	***FOSS Earth and Sun*** **IG:** pp. 101, 112, 122, 124, 136, 143, 178, 181, 199, 209 **TR:** pp. C18-C20, C44-C45				**5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.** [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [*Assessment*	***FOSS Earth and Sun*** **IG:** pp. 57, 59 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG pp. 142-143 (Steps 27-29) IG p. 182 (Step 18) IG p. 229 (Step 15) *Response Sheet* IG p. 127 SNM No. 3 <u>Benchmark Assessment</u> ***FOSS Earth and Sun* ACG** pp. 2-3 (Items 1ab) pp. 4-5 (Item 2) pp. 16-17 (Items 12 and 13) pp. 18-19 (Items 1ab) pp. 20-21 (Items 3			
DCI	**ESS1.B: Earth and the Solar System** ▪ The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2)	***FOSS Earth and Sun*** **IG:** pp. 57, 93, 95 100-101, 111, 113 (Step 12), 115, 122 (Step 13), 124 (Step 19), 126 (Step 22), 128 (Step 25), 132, 133-139 (Steps 5-20), 142 (Steps 26-27), 144, 145 (Step 31), 155, 165-166, 177 (Step 9), 185, 228-229, 234 (Step 22) **SRB:** pp. 3-7, 10-13, 34-35								

		DOR: "Tutorial: Sun Tracking" (Link) *Shadow Tracker* (Link)				*Boundary: Assessment does not include causes of seasons*.]	and 4) pp. 22-23 (Items 5ab) pp. 24-25 (Item 6) pp. 26-27 (Items 7ab) pp. 28-29 (Item 2) pp. 30-31 (Items 3abc) pp. 34-35 (Items 7ab) pp. 36-37 (Item 8) Interim Assessment *Earth Science Task 2—Shadows*			
CCC	**Patterns** ▪ Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5-ESS1-2)	***FOSS Earth and Sun*** **IG:** pp. 102, 113, 122, 124, 143, 178, 185, 199, 211, 229, 233 **SRB:** p.13 **TR:** pp. D6-D9, D28-D29								

5-ESS2 Earth's Systems

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Develop a model using an example to describe a scientific principle. (5-ESS2-1)	***FOSS Living Systems*** **IG:** pp. 88, 113, 122, 130, 137 ***FOSS Earth and Sun*** **IG:** pp. 258, 260, 361, 377, 386-387, 401, 404, 422 (Step 21) **TR:** pp. C11-C13, C36-C39				**5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** [Clarification	***FOSS Living Systems*** **IG:** pp. 49, 55 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 102 (Step 13) IG p. 116 (Step 29)			

DCI	**ESS2.A: Earth Materials and Systems** ▪ Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)	***FOSS Living Systems*** **IG:** 79, 87, 106, 107 (Step 6), 108, 114 (Step 26), 115, 126 (Step 20), 137, 261, 269, 313 (Step 8), 316 **SRB:** pp. 7-11, 74-78 **DOR**: *Marine Ecosystems* (Link) ***FOSS Earth and Sun*** **IG:** pp. 239, 250, 272 (Step 11), 286, 287, 304-305, 345, 367, 376-377, 379, 386-387 (Steps 14-15), 405 (Steps 14, 17), 410 (Step 27), 411, 422 (Step 21), 423 (Step 24) **SRB:** pp. 81-84, 85-91, 105-109, 120-123 125-129, 130-138, 139-143 **DOR:** *All about Meteorology* (Link) *Water Cycle* (Link) "Water Cycle Game" (Link)				Statement: ****The geosphere, hydrosphere (including ice), atmosphere, and biosphere are each a system and each system is a part of the whole Earth System.** Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere.	*Performance Assessment* IG p. 132 (Step 6) Benchmark Assessment ***FOSS Living Systems* ACG** pp. 14-15 (Items 9ab) pp. 24-25 (Item 6) ***FOSS Earth and Sun*** **IG:** pp. 57, 61 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 273 (Step 12) IG p. 333 (Step 28) *Performance Assessment* IG p. 386 (Step 12) *Response Sheet* IG p. 353 SNM No. 22			
CCC	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (5-ESS2-1)	***FOSS Living Systems*** **IG:** pp. 79, 81, 82-83, 87, 90-91, 97, 99, 102, 122, 132, 137, 261, 311, 312, 313, 316 **SRB:** pp. 3-4								

		DOR: *Geography for Students - Physical Systems* (Link) ***FOSS Earth and Sun*** **IG:** pp. 252, 258, 259, 261, 268, 286, 378, 386-387 (Steps 14-15), 395, 402, 405, 417, 419, 422 (Step 21) **TR:** pp. D16-D18, D34-D37				The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [*Assessment Boundary: Assessment is limited to the interactions of two systems at a time.*]	Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 6-7 (Item 4) pp. 8-9 (Item 5) pp. 12-13 (Item 8) pp. 14-15 (Items 10 and 11) pp. 28-29 (Item 1) pp. 42-43 (Item 4) pp. 44-45 (Items 7abc) pp. 46-47 (Items 1ab) pp. 48-49 (Items 2ab and 3) pp. 50-51 (Item 4) pp. 52-53 (Item 5) pp. 54-55 (Item 6)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Using Mathematics and Computational Thinking** Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to	***FOSS Earth and Sun*** **IG:** pp. 377, 394, 400 401-402, 403-404 **SRB:** p. 124 **TR:** pp. C21-C22, C46-C47				**5-ESS2-2.** Describe and graph the amounts of salt water and fresh water in various	***FOSS Earth and Sun*** **IG:** pp. 57, 63 **FOSS Assessment System** Embedded			

	analyze data and compare alternative design solutions. ▪ Describe and graph quantities such as area and volume to address scientific questions. (5-ESS2-2)					reservoirs to provide evidence about the distribution of water on Earth. [Assessment Boundary: *Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]*	Assessment *Notebook Entry* **IG:** p. 406 (Step 20) Benchmark Assessment ***FOSS Earth and Sun* ACG** pp.10-11 (Items 7ab)			
DCI	**ESS2.C: The Roles of Water in Earth's Surface Processes** ▪ Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)	***FOSS Earth and Sun*** **IG:** pp. 367, 376-377, 379, 400, 401-402, 404 (Step 14), 406 (Step 20), 422 **SRB:** p. 124 **DOR:** "Water Cycle Game" (Link)								
CCC	**Scale, Proportion, and Quantity** ▪ Standard units are used to measure and describe physical quantities such as weight and volume. (5-ESS2-2)	***FOSS Earth and Sun*** **IG:** pp. 402, 417, 419, 422 **TR:** pp. D13-D15, D32-D33								

5-ESS3 Earth and Human Activity

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.	***FOSS Living Systems*** **IG:** pp. 271, 296, 304, 307, 315, 316				**5-ESS3-1. Obtain and combine information about ways individual communities**	***FOSS Living Systems*** **IG:** pp. 47, 55 **FOSS Assessment System**			

	▪ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)	***FOSS Earth and Sun*** **IG:** pp. 331, 332, 355, 359, 360, 361 (Step 28), 408, 416, 419, 422 (Step 21) **TR:** pp. C33-C35, C52-C55				**use science ideas to protect the Earth's resources and environment.**	Benchmark Assessment ***FOSS Living System* ACG** pp. 16-17 (Item 11) ***FOSS Earth and Sun*** **IG:** pp. 57, 61, 63 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 421 (Step 20) Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 8-9 (Item 6) pp. 14-15 (Item 10) pp. 56-57 (Item 7)			
DCI	**ESS3.C: Human Impacts on Earth 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)	***FOSS Living Systems*** **IG:** pp. 108 (Step 6), 270, 307, 309 (Step 4), 316 **SRB:** pp. 73, 74-80 **DOR:** *Marine Ecosystems* (Link) ***FOSS Earth and Sun*** **IG:** pp. 295, 346, 359-360 (Steps 26-27), 361, 376-377, 421 (Step 20), 422 **SRB:** pp. 144-151 **DOR:** *Climate and Seasons* (Link)							

CCC	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (5-ESS3-1)	***FOSS Living Systems*** **IG:** pp. 272, 278, 280, 297, 311, 312, 313, 316 **SRB:** pp. 3-4, 5-6 ***FOSS Earth and Sun*** **IG**: pp. 386, 387, 388, 395, 402, 405, 417, 419, 422 (Step 21) **TR:** pp. D16-D18, D34-D37								
CCC	***Connections to Nature of Science*** **Science Addresses Questions About the Natural and Material World.** ▪ Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)	***FOSS Living Systems*** **IG:** pp. 2, 4, 39, 248 **SRB:** pp. 74-80 ***FOSS Earth and Sun*** **IG:** pp. 316 (Step 16), 417 (Step 11), 421 (Step 18)								

5-PS1 Matter and Its Interactions

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Develop a model to describe phenomena. (5-PS1-1)	***FOSS Earth and Sun*** **IG:** p 239, 251, 258, 260, 264, 273 (Step 14), 286 (Step 19) **DOR: "**Tutorial: Air and Atmosphere" (Link) ***FOSS Mixtures and Solutions*** **IG:** pp. 97, 115 (Step 8), 118 (Teaching Note), 147, 157, 163, 164, 166, 167, 168 (Steps 26-28), 179 (Step 13), 184 (Step 6), 186 (Step 10), 190, 209-210 (Steps 13-14), 211, 219 (Step 16), 279, 321 (Step 1), 344 (Step 14), 345 (Step 16, Teaching Note) **SRB:** pp. 14-15, 26-27, 28-29, 30, 32, 47, 48 **TR:** pp. C11-C13, C36-C39				**5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.** [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [*Assessment Boundary: Assessment does not include the atomic-scale*	***FOSS Earth and Sun*** **IG:** pp. 57, 61, 63 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 264 (Step 21) *Performance Assessment* IG p. 258 (Step 7) Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 12-13 (Item 8) pp. 38-39 (Items 1 and 2) pp. 40-41 (Items 3ab) pp. 42-43 (Items 5 and 6) pp. 44-45 (Items 7abc) pp. 48-49 (Items			

DCI	**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 and the effects of air on larger particles or objects. (5-PS1-1)	***FOSS Earth and Sun*** **IG:** pp. 239, 241, 250, 259 (Step 10), 260 (Steps 13-14), 261, 262 (Step 17), 273 (Step 14), 286 (Step 19), 290 **SRB:** pp. 105-108, 121 **DOR: "**Tutorial: Air and Atmosphere" (Link) ***FOSS Mixtures and Solutions*** **IG:** pp. 111, 115 (Step 8), 116 (Step 9 and Teaching Note), 142, (Step 18), 156, 221-222 (Steps 19-21), 230, 258, 265 (Step 9), 268 (Step 16), 314-15, 330 (Step 6), 332 (Step 12), 341 (Steps 4 and 6) **SRB:** pp. 7, 24, 26-27,32, 42-43, 75 **DOR: "**Tutorial: Solutions" (Link) "Tutorial: Conservation of				*mechanism of evaporation and condensation or defining the unseen particles*.]	2ab) pp. 54-55 (Item 6) ***FOSS Mixtures and Solutions*** **IG:** pp. 49, 55 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 111 (Step 20) IG p. 210 (Step 17) IG p. 239 (Step 11) *Performance Assessment* IG p. 226 (Step 4) IG p. 284 (Step 7) *Response Sheet* IG p. 219 SNM No. 12 IG p. 279 SNM No. 15 <u>Benchmark Assessment</u> ***FOSS Mixtures and Solutions* ACG**			

		Mass" (Link) *Changes in Properties of Matter* (Link) *Chemical Reactions* (Link)					pp. 14-15 (Item 10) pp.16-17 (Items 1ab) pp. 18-19 (Item 3) pp. 22-23 (Items 6ab)			
CCC	**Scale, Proportion, and Quantity** ▪ Natural objects exist from the very small to the immensely large. (5-PS1-1)	***FOSS Earth and Sun*** **IG:** pp. 252, 260 (Step 14), 268, 282 ***FOSS Mixtures and Solutions*** **IG:** pp. 98, 109, 115 (Step 8), 127, 202, 208 (Step 9), 226, 227, 268, 316, 342 **SRB:** pp. 8, 26, 27 **TR:** pp. D13-D15, D32-D33					pp. 24-25 (Items 7 and 8) pp. 34-35 (Item 1a) pp. 40-41 (Item 2) Interim Assessment *Physical Science Task 1—The Science of Party Planning*			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Using Mathematics and Computational Thinking** Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare	***FOSS Mixtures and Solutions*** **IG:** pp. 97, 115 (Steps 6-7), 117, 188 (Step 14), 209-210 (Step 13), 239, 277 (Steps 8-9), 287 **SRB:** pp. 11, 14-15,				**5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of**	***FOSS Mixtures and Solutions*** **IG:** pp. 49, 51, 53, 55 **FOSS Assessment System**			

	alternative design solutions. ▪ Measure and graph quantities such as weight to address scientific and engineering questions and problems. (5-PS1-2)	30-31 **DOR:** "Tutorial: Conservation of Mass" (Link) **TR:** pp. C21-C22, C46-C47				**change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.** [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that forms new substances.] [*Assessment Boundary: Assessment does not include distinguishing mass and weight.]*	Embedded Assessment *Notebook Entry* IG p. 269 (Step 21) *Performance Assessment* IG p. 226 (Step 4) IG p. 284 (Step 7) *Response Sheet* IG p. 117 SNM No. 4 IG p. 188 SNM No. 8 IG p. 219 SNM No. 12 IG p. 279 SNM No. 15 Benchmark Assessment ***FOSS Mixtures and Solutions* ACG** pp. 2-3 (Items 1 and 2) pp. 8-9 (Items 6ab) pp. 12-13 (Items 9ab) pp. 14-15 (Items 11 and 12) pp. 20-21 (Item 4) pp. 22-23 (Items			
DCI	**PS1.A: Structure and Properties of Matter** ▪ The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)	***FOSS Mixtures and Solutions*** **IG:** pp. 115 (Step 8), 116 (Step 9), 117 (Step 13), 184 (Step 5), 203, 222, 258, 278 (Step 12), 279 (Step 19), 286 (Step 16), 345 (Step 16) **SRB:** pp. 10, 11, 30, 31 **DOR: "**Tutorial: Concentration" (Link) **"**Tutorial: Solutions" (Link) *Changes in Properties of Matter* (Link)								
DCI	**PS1.B: Chemical Reactions** ▪ No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)	***FOSS Mixtures and Solutions*** **IG:** pp. 314-15, 334 (Step 18), 341 (Steps 4-6), 342 (Step 7), 344 (Step 15), 347 (Steps 20-21) **SRB:** pp. 74-78								

CCC	**Scale, Proportion, and Quantity** ▪ Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1-2)	***FOSS Mixtures and Solutions*** **IG:** pp. 114 (Step 2), 115 (Step 7), 190, 202, 217, 260, 301 **SRB:** pp. 11, 22, 40, 47, 81 **TR:** pp. D13-D15, D32-D33					6ab) pp. 34-35 (Item 1a) pp. 42-43 (Items 4ab) pp. 50-51 (Items 4 and 5) <u>Interim Assessment</u> *Physical Science Task 1—The Science of Party Planning*			
CCC	***Connections to Nature of Science*** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** ▪ Science assumes consistent patterns in natural systems. (5-PS1-2)	***FOSS Mixtures and Solutions*** **IG:** pp. 117 (Step 15), 178, 242 (Step 16) **SRB:** pp. 18-20, 38-40							

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.	***FOSS Mixtures and Solutions*** **IG:** pp. 259, 267, 277, 284, 285, 295, 321, 322, 329, 341 **SRB:** pp. 14-15 **TR:** pp. C14-C17, C46-C47				**5-PS1-3. Make observations and measurements to identify materials based on their properties.**	***FOSS Mixtures and Solutions*** **IG:** pp. 49, 53, 55 **FOSS Assessment System**			

	▪ Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (5-PS1-3)					[Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [*Assessment Boundary: Assessment does not include density or*	<u>Embedded Assessment</u> *Performance Assessment* IG p. 226 (Step 4) IG p. 284 (Step 7) *Response Sheet* IG p. 279 SNM No. 15 <u>Benchmark Assessment</u> ***FOSS Mixtures and Solutions* ACG** pp. 6-7 (Item 5) pp. 8-9 (Item 7) pp. 10-11 (Item 8) pp. 40-41 (Item 3) pp. 44-45 (Item 7) pp. 48-49 (Item 3) pp. 52-53 (Items 6ab) pp. 54-55 (Items 7ab)			
DCI	**PS1.A: Structure and Properties of Matter** ▪ Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)	***FOSS Mixtures and Solutions*** **IG:** pp. 249, 258, 277 (Steps 9-10), 279 (Step 17), 284 (Step 5), 286 (Step 16), 329 (Step 3), 332 (Step 12) **SRB:** pp. 9 and 22 **DOR: "**Tutorial: Saturation" (Link) "Tutorial: Solutions" (Link)							
CCC	**Scale, Proportion, and Quantity** ▪ Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1-3)	***FOSS Mixtures and Solutions*** **IG:** pp. 268 (Step 16), 277 (Step 8), 284, 342 **SRB:** pp. 18-20, 38-40 **TR:** pp. D13-D15, D32-D33								

						distinguishing mass and weight.]				

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4)	***FOSS Mixtures and Solutions*** **IG:** pp. 315, 321, 322, 329-330 (Steps 3-6), 340-341(Steps 2-3) **TR:** pp. C14-C17, C46-C47				**5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances. [**Clarification Statement: Examples of combinations that do not produce new substances could include sand and water. Examples of combinations that do produce new substances could include**	***FOSS Mixtures and Solutions*** **IG:** pp. 49, 55 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 325 (Step 20) *Response Sheet* IG p. 332 SNM No. 18 <u>Benchmark Assessment</u> ***FOSS Mixtures and Solutions* ACG** pp. 4-5 (Item 3a) pp. 6-7 (Item 4) pp. 8-9 (Item 7) pp. 12 -13 (Items 9ab)			
DCI	**PS1.B: Chemical Reactions** ▪ When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)	***FOSS Mixtures and Solutions*** **IG:** pp. 307, 314-315, 325 (Step 20), 326 (Step 23), 330 (Step 7), 332 (Steps 12-13), 335 (Step 20), 341 (Step 6) **SRB:** pp. 74-78, 79-80								

		DOR: *Chemical Reactions* (Link) *Changes in Properties of Matter* (Link) "Tutorial: Reaction or not?" (Link)				**baking soda and vinegar or milk and vinegar.]**	pp. 14-15 (Item 12) Interim Assessment *Physical Science Task 2—Mixing Matter*			
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified, tested, and used to explain change. (5-PS1-4)	***FOSS Mixtures and Solutions*** **IG:** pp. 316, 325, 332, 335, 341 **SRB:** pp. 79-80 **TR:** pp. D10-D12, D30-D31								

5-PS2 Motion and Stability: Forces and Interactions

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Engaging in Argument from Evidence** Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). ▪ Support an argument with evidence, data, or a model. (5-PS2-1)	***FOSS Earth and Sun*** **IG:** pp. 167, 189, 217 **TR:** pp. C27-C32, C50-C53				**5-PS2-1** **Support an argument that the gravitational force exerted by Earth on objects is directed down.** [Clarification Statement:	***FOSS Earth and Sun*** **IG:** pp. 57, 59 **FOSS Assessment System** Embedded Assessment *Response Sheet* IG p. 218			

DCI	**PS2.B: Types of Interactions** ▪ The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1)	***FOSS Earth and Sun*** **IG:** pp. 3, 151, 155, 162, 170, 215 (Step 24), 217-218 (Steps 27-29), 219 (Step 32), 233 (Step 22) **SRB:** pp. 62-65 **DOR:** *The Planets and the Solar System* (Link)				"Down" is a local description of the direction that points toward the center of the spherical Earth.] [*Assessment Boundary: Assessment does not include mathematical representation of gravitational force*.]	SNM No.10 Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 12-13 (Item 9) pp. 32-33 (Item 4)			
CCC	**Cause and Effect** ▪ Cause and effect relationships are routinely identified and used to explain change. (5-PS2-1)	***FOSS Earth and Sun*** **IG:** pp. 168, 219 (Step 32), 233 (Step 22) **TR:** pp. D10-D12, D30-D31								

5-PS3 Energy

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. ▪ Use models to describe phenomena. (5-PS3-1)	***FOSS Living Systems*** **IG:** pp. 88, 115, 123, 151, 172, 176, 209, 224, 240, 242, 257 **TR:** pp. C11-C13, C36-C39				**5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to**	***FOSS Living Systems*** **IG:** pp. 47, 49, 51, 53, 55 **FOSS Assessment System**			

DCI	**PS3.D: Energy in Chemical Processes and Everyday Life** ▪ 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)	***FOSS Living Systems*** **IG:** pp. 83, 110 (Step 13), 115 (Step 26), 121 (Step 3), 123 (Step 14), 126 (Step 20), 150-151, 172 (Step 9), 173 (Step 11), 315 (Step 12) **SRB:** pp. 7, 8, 24, 26 **DOR:** *Food Chains* (Link) *Web of Life: Life in the Sea* (Link)				**maintain body warmth) was once energy from the sun.** [Clarification Statement: Examples of models could include diagrams, and flow charts.]	Embedded Assessment *Notebook Entry* **IG:** p. 175 (Step 16) *Response Sheet* IG p. 123 SNM No. 4 IG p. 190 SNM No. 11 Benchmark Assessment ***FOSS Living Systems* ACG** pp. 4-5 (Item 1c) pp. 10-11 (Item 6) pp. 20-21 (Item 3) pp. 22-23 (Items 5ab) pp. 24-25 (Item 7) pp. 28-29 (Items 9 and 10) pp. 34-35 (Items 4 and 5) pp. 36-37 (Item 6)			
DCI	**LS1.C: Organization for Matter and Energy Flow in Organisms** ▪ 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)	***FOSS Living Systems*** **IG:** pp. 110 (Step 12), 112 (Step 18), 113 (Step 22), 122, 130 (Step 1), 143, 150-151, 161-162 (Steps 18-19), 191 (Step 22), 208-209, 242 (Step 18) **SRB:** pp. 27-31 **DOR:** *Food Chains* (Link) *Web of Life: Life in the Sea* (Link)								
CCC	**Energy and Matter** ▪ Energy can be transferred in various ways and between objects. (5-PS3-1)	***FOSS Living Systems*** **IG:** pp. 89, 111 (Step 14), 112, 115, 123,								

		126 (Step 20), 137, 152, 160, 172, 173, 193, 210, 229, 311, 313 **TR:** pp. D19-D21, D38-D41								

3–5-ETS1 Engineering Design

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Asking Questions and Defining Problems** Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. ▪ Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3–5-ETS1-1)	***FOSS Mixtures and Solutions*** **IG:** pp. 97, 127,132 (Steps 19-20), 259, 287, 297, 299 (Step 23) **SRB:** pp. 14-15 **TR:** pp. C7-C11, C36-C37				**3–5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**	***FOSS Mixtures and Solutions*** **IG:** pp. 49, 51, 53 **FOSS Assessment System** <u>Embedded Assessment</u> *Notebook Entry* IG p. 298 (Step 21) <u>Benchmark Assessment</u> ***FOSS Mixtures and Solutions* ACG** pp. 4-5 (Item 3a)			
DCI	**ETS1.A: Defining and Delimiting Engineering Problems** ▪ Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution	***FOSS Mixtures and Solutions*** **IG:** pp. 96, 127 (Step 6), 127 (Step 9), 132 (Step 21), 297 (Steps 16-21), 301 (Step 29) **SRB:** pp. 54-61								

	(criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3–5-ETS1-1)									
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ People's needs and wants change over time, as do their demands for new and improved technologies. (3–5-ETS1-1)	***FOSS Mixtures and Solutions*** **IG:** pp. 98 and 298 (Step 22) **SRB:** pp. 54-61 **DOR:** *Water Cycle* (Link)								

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. ▪ Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3–5-ETS1-2)	***FOSS Earth and Sun*** **IG:** pp. 305 and 358 ***FOSS Mixtures and Solutions*** **IG:** pp. 97, 128, 132 (Step 21), 297, 299 (Step 25) **SRB:** pp. 14-15, 62-67 **TR:** pp. C23-C26, C48-C51				**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.**	***FOSS Earth and Sun*** **IG:** pp. 57, 59, 61 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 355 (Step 14)			

DCI	**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) ▪ 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)	***FOSS Earth and Sun*** **IG:** pp. 304-305, 354 (Step 7), 357 (Step 20), 361 ***FOSS Mixtures and Solutions*** **IG:** pp. 127 (Steps 6-9), 297 (Step 19), 301 **SRB:** pp. 50-53					Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 14-15 (Item 10) pp. 56-57 (Item 8) ***FOSS Mixtures and Solutions*** **IG:** pp. 49, 51, 53 **FOSS Assessment System** Embedded Assessment *Notebook Entry* IG p. 298 (Step 21) *Performance Assessment* IG p. 127 (Steps 6-9) Benchmark Assessment ***FOSS Mixtures and Solutions* ACG** pp. 4-5 (Item 3a) pp. 6-7 (Item 4) pp. 8-9 (Item 7) pp. 12-13 (Items 9ab)			
CCC	**Influence of Engineering, Technology, and Science on Society and the Natural World** ▪ Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3–5-ETS1-2)	***FOSS Earth and Sun*** **IG:** pp. 346 (Step 28) and 360 (Step 27) **SRB:** pp. 110-111 ***FOSS Mixtures and Solutions*** **IG:** p. 300 **SRB:** pp. 62-69								

							pp. 14-15 (Item 12) pp. 18-19 (Item 2) pp. 22-23 (Item 6b)			

Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts		Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions	Performance Expectation	Publisher Citations	Meets Standard		Reviewer Comments, Citations, and Questions
			Y	N				Y	N	
SEP	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3–5-ETS1-3)	***FOSS Earth and Sun*** **IG:** pp. 294, 313, 315, 325, 339, 340, 353, 355 ***FOSS Mixtures and Solutions*** **IG:** pp. 88, 96, 128 (Step 13), 132 (Step 19), 137-138 (Steps 6-8) **SRB:** pp. 14-15 **TR:** pp. C14-C17, C46-C47				**3–5-ETS1-3. 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.**	***FOSS Earth and Sun*** **IG:** pp. 57, 61 **FOSS Assessment System** Embedded Assessment *Performance Assessment* IG p. 355 (Step 14) Benchmark Assessment ***FOSS Earth and Sun* ACG** pp. 14-15 (Item 11) ***FOSS Mixtures and Solutions*** **IG:** pp. 49, 51 **FOSS Assessment System**			
DCI	**ETS1.B: Developing Possible Solutions** ▪ Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3–5-ETS1-3)	***FOSS Earth and Sun*** **IG:** pp. 295, 304-305 ***FOSS Mixtures and Solutions*** **IG:** pp. 3, 96, 127 (Step 9), 132 (Steps 19-21)								

DCI	**ETS1.C: Optimizing the Design Solution** ▪ Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3–5-ETS1-3)	***FOSS Earth and Sun*** **IG:** pp. 295, 304-305, 354 (Step 7) ***FOSS Mixtures and Solutions*** **IG:** pp. 96, 132 (Steps 19-21)					Benchmark Assessment ***FOSS Mixtures and Solutions* ACG** pp. 4-5 (Item 3a)			