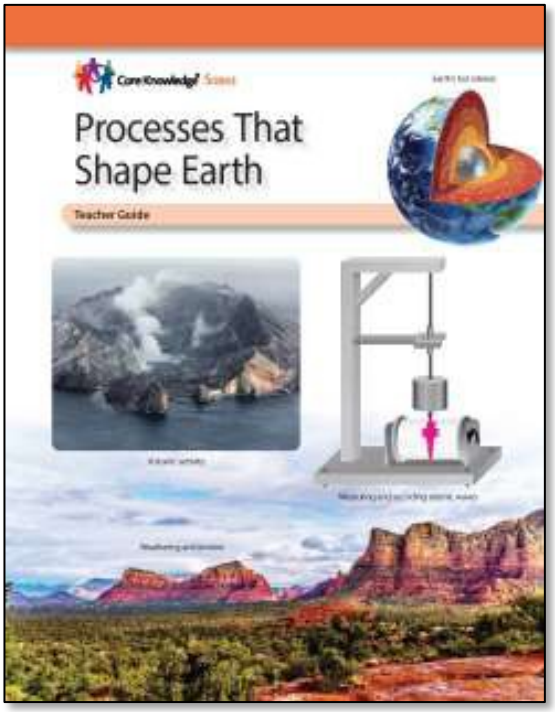
Online Resources

Processes That Shape Earth

Click on each lesson to access its online resources. Page numbers refer to pages in the Teacher Guide. Some links provide access to files created by the Core Knowledge Foundation, including PDF documents that you can download and view with the appropriate software (such as Adobe Reader).



Extend and customize this unit for your students using the CKSci Additional Activities

Online Resources

About This Unit

Page	Resource Links

1	Note to Teachers and Curriculum Planners
	• The learning progressions of Disciplinary Core Ideas offer guidance regarding the scope and sequence of learning about Earth's Systems in the elementary grades and beyond.
	  ○ ESS1.C: The History of Planet Earth
	  ○ ESS2.A: Earth Materials and Systems
	  ○ ESS2.B: Plate Tectonics and Large-Scale System Interactions
	  ○ ESS2.E: Biogeology
	  ○ ESS3.B: Natural Hazards
	• Learn more about these core ideas and their related content by reading the corresponding section of *A Framework for K-12 Science Education.*
	See also the Teachers Resources section of this guide.

2	Note to Core Knowledge Teachers: 2019 Core Knowledge Science Sequence for this unit: Domain—Processes that Shape Earth CKSci correlations to the 2010 Core Knowledge Sequence— • GRADE 3 • GRADE 4 • GRADE 5 • Interactive graphic of these correlations
3	This unit has been informed by the following Next Generation Science Standards (NGSS) Performance Expectations: Topic—4. Earth's Systems: Processes that Shape Earth • 4-ESS1-1 • 4-ESS2-1 • 4-ESS2-2 • 4-ESS3-2* * *Expectations that integrate engineering design practices and knowledge are note above with an asterisk.*
14	Resources for Effective and Safe Classroom Activities
16	Materials Supply List: Grade 4 Unit 4 Processes That Shape Earth
18	Pacing Guides for CKSci Grades 3–5

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Part A: Problem-Based Learning Introduction
Lesson 1

Page	Resource Links
26	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Disciplinary Core Idea: ETS1.B *Designing Solutions to Engineering Problems* • From the Framework: Pages 206–208
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
	Crosscutting Concept: *Influence of Engineering, Technology, and Science on Society and the Natural World* Connections to Engineering, Technology and Applications of Science
24	[VIDEOS] Earthquake [1:25 – 2:00] Volcanic eruption Landslide Sandstorm [IMAGES] Earth Science World Image Bank

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Part B: The Structure of Our Earth
Lesson 2

Page	Resource Links
30	Disciplinary Core Idea: ESS2.B *Plate Tectonics and Large-Scale System Interactions* • From the Framework: Pages 182–183
	Disciplinary Core Idea: ESS1.C *The History of Planet Earth* • From the Framework: Pages 177–179
	Crosscutting Concept: *Patterns* • From the Framework: Pages 85–87 Crosscutting Concept: *Scale, Proportion, and Quantity* • From the Framework: Pages 89–91
	Science and Engineering Practices: *Asking Questions and Defining Problems* • From the Framework: Pages 54–56 Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
33	[IMAGE] Alfred Wegener
34	[WEBLINK] Geologic Time

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Lesson 3

Page	Resource Links
37	Disciplinary Core Idea: ESS2.B *Plate Tectonics and Large-Scale System Interactions* • From the Framework: Pages 182–183
	Crosscutting Concept: *Scale, Proportion, and Quantity* • From the Framework: Pages 89–91
	Science and Engineering Practices: *Analyzing and Interpreting Data* • From the Framework: Pages 61–63 Science and Engineering Practices: *Developing and Using Models* • From the Framework: Pages 56–59

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Lesson 4

Page	Resource Links
43	Disciplinary Core Idea: ESS1.C *The History of Planet Earth* • From the Framework: Pages 177–178
	Disciplinary Core Idea: ESS2.A *Earth Materials and Systems* • From the Framework: Pages 179–181
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89 Crosscutting Concept: *Patterns* • From the Framework: Pages 85–87
	Science and Engineering Practices: *Planning and Carrying Out Investigations* • From the Framework: Pages 59–61 Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
46	[WEBLINK] Rock types and formation
49	[WEBLINK] GIS

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Part C: Earth's Moving Crust
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53	Disciplinary Core Idea: ESS2.B *Plate Tectonics and Large-Scale System Interactions* • From the Framework: Pages 182–183
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89 Crosscutting Concept: *Patterns* • From the Framework: Pages 85–87
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
56	[WEBLINKS] Earthquake location visualization USGS Resources
58	[WEBLINK] Earthquake hazard resources

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60	Performance Expectation: • 4-ESS3-2 Evidence Statements for 4-ESS3-2
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Disciplinary Core Idea: ETS1.B *Designing Solutions to Engineering Problems* • From the Framework: Pages 206–208
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
	Crosscutting Concept: *Influence of Engineering, Technology, and Science on Society and the Natural World* Connections to Engineering, Technology and Applications of Science
	[WEBLINK] Teacher background resource
61	[WEBLINK] Fair test
63	[IMAGES] Earthquake damaged buildings
64	[VIDEO] Natural frequency and building height
65	[VIDEO] Shake table

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69	Disciplinary Core Idea: ESS2.B *Plate Tectonics and Large-Scale System Interactions* • From the Framework: Pages 182–183
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
73	[WEBLINK] Tsunami Hazard Mitigation Program
74	[WEBLINK] DART network
75	[WEBLINK] Tsunami maps [WEBLINK] Tsunami travel time maps [VIDEOS] Tsunami animations

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77	Disciplinary Core Idea: ESS2.B *Plate Tectonics and Large-Scale System Interactions* • From the Framework: Pages 182–183
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
80	[WEBLINK] Volcano monitoring
81	[VIDEOS] Volcanic activity
82	[VIDEO] Gas spectrometer monitoring
83	[VIDEO] Option 1 [VIDEO] Option 2

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Page	Resource Links
84	Performance Expectation: • 4-ESS2-2 Evidence Statements for 4-ESS2-2
	Disciplinary Core Idea: ESS2.B *Plate Tectonics and Large-Scale System Interactions* • From the Framework: Pages 182–183
	Crosscutting Concept: *Patterns* • From the Framework: Pages 85–87
	Science and Engineering Practices: *Analyzing and Interpreting Data* • From the Framework: Pages 61–63
86	[WEBLINK] USGS
88	[WEBLINK] Infographic tools

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Part D: Other Changes on Earth's Surface
Lesson 10

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93	Disciplinary Core Idea: ESS1.C *The History of Planet Earth* • From the Framework: Pages 177–179
	Disciplinary Core Idea: ESS2.A *Earth Materials and Systems* • From the Framework: Pages 179–181
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
96	[WEBLINK] Coastal erosion
97	[VIDEO] Sinkholes
98	[VIDEO] Erosion demonstration

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100	Performance Expectation: • 4-ESS2-1 Evidence Statements for 4-ESS2-1
	Disciplinary Core Idea: ESS2.A *Earth Materials and Systems* • From the Framework: Pages 179–181
	Disciplinary Core Idea: ESS2.E *Biogeology* • From the Framework: Pages 189–190
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Planning and Carrying Out Investigations* • From the Framework: Pages 59–61
103	[VIDEO] Extreme erosion

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107	Disciplinary Core Idea: ESS2.A *Earth Materials and Systems* • From the Framework: Pages 179–181
	Disciplinary Core Idea: ESS2.C *The Roles of Water in Earth's Surface Processes* • From the Framework: Pages 179–181
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Crosscutting Concept: *Scale, Proportion, and Quantity* • From the Framework: Pages 89–91
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
109	[VIDEO] Rapid erosion
110	[WEBLINK] USGS landslide resources
111	[VIDEO] Geologist on landslide prevention [3:11]

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114	Performance Expectation: • 4-ESS3-2 Evidence Statements for 4-ESS3-2
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Disciplinary Core Idea: ETS1.B *Designing Solutions to Engineering Problems* • From the Framework: Pages 206–208
	Crosscutting Concept: *Cause and Effect* • From the Framework: Pages 87–89
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
	Crosscutting Concept: *Influence of Engineering, Technology, and Science on Society and the Natural World* Connections to Engineering, Technology and Applications of Science
117	[WEBLINK] Student landslide research resource

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Part E: Managing the Effects of Earth's Processes in Our Area

Problem-Based Learning Project

Unit Capstone: Sharing Community Solutions

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122	Performance Expectation: • 4-ESS3-2 Evidence Statements for 4-ESS3-2
	Disciplinary Core Idea: ESS3.B *Natural Hazards* • From the Framework: Pages 192–194
	Disciplinary Core Idea: ETS1.B *Designing Solutions to Engineering Problems* • From the Framework: Pages 206–208
	Science and Engineering Practices: *Constructing Explanations and Designing Solutions* • From the Framework: Pages 67–71
	Crosscutting Concept: *Influence of Engineering, Technology, and Science on Society and the Natural World* Connections to Engineering, Technology and Applications of Science
125	[IMAGES] Student Reader images [WEBLINKS] Hazard maps Earthquakes Volcanoes Landslides World erosion

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Teacher Resources

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14	Resources for Effective & Safe Classroom Activities *(also, see below re: page 186)*
16	Materials Supply List: Grade 4 Unit 4 *Processes That Shape Earth*
179	Activity Pages Answer Key
186	Safety in the Science Classroom: • NSTA Safety Resources • Safety Resources for Elementary Teachers
	Teacher Guide Appendices: • Appendix A – Glossary • Appendix B – Safety for Activities • Appendix C – Strategies for Acquiring Materials • Appendix D – Advance Preparation • Appendix E – Unexpected Activity Results

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