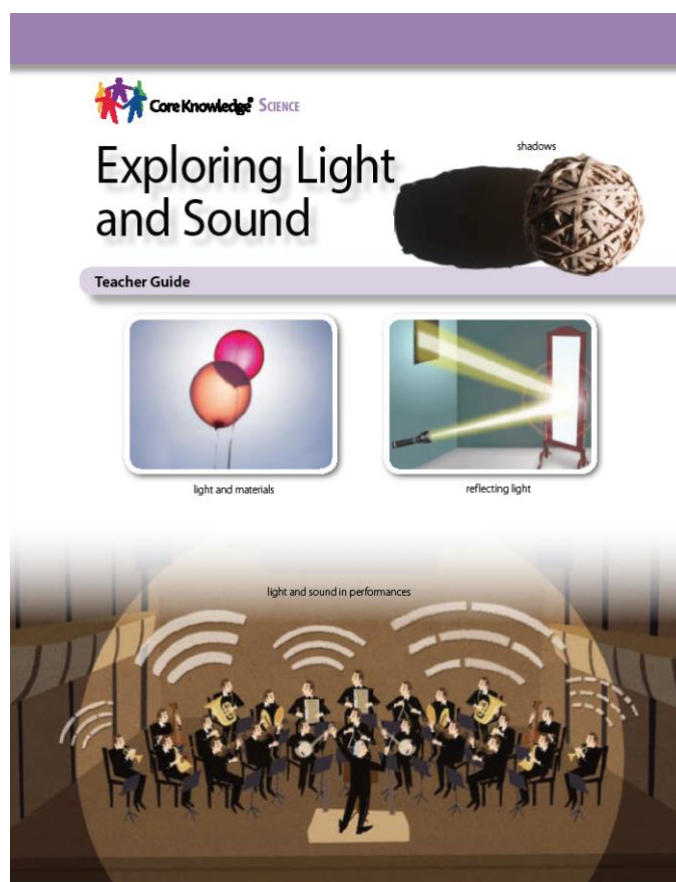


## Exploring Light and Sound

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 Acrobat Reader DC](#)).

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<b>Unit Supplement</b>	<a href="#">Unit Supplement</a>
	<a href="#">Teacher Resources</a>



## About this Unit

Page	Resource Links
2	<p>Note to Teachers and Curriculum Planners</p> <ul style="list-style-type: none"> <li>The learning progressions of Disciplinary Core Ideas <a href="#">PS2.A</a> and <a href="#">PS2.B</a> offer guidance regarding the scope and sequence of learning about forces and motion as well as types of interactions in the elementary grades and beyond.</li> <li>Learn more about this core idea and its related content by reading the corresponding section of <a href="#">A Framework for K–12 Science Education</a>.</li> </ul> <p>See also the <a href="#">Teachers Resources</a> section of this guide.</p> <p><a href="#">To see an overview of the entire Core Knowledge Science program, visit link]</a></p>
3	<p>This unit has been informed by the following Next Generation Science Standards (NGSS) Performance Expectations:</p> <p>Topic—<a href="#">Properties of Matter</a></p> <ul style="list-style-type: none"> <li><a href="#">1-PS4-1</a></li> <li><a href="#">1-PS4-2</a></li> <li><a href="#">1-PS4-3</a></li> <li><a href="#">1-PS4-4</a></li> </ul>
9	<p><a href="#">CKSci Online Resources</a></p> <p><a href="#">Recommended Science Trade Books</a></p>
12	<p>NGSS References</p> <ul style="list-style-type: none"> <li><a href="#">DCI</a></li> <li><a href="#">CCC</a></li> <li><a href="#">SEP</a></li> </ul>
13	<ul style="list-style-type: none"> <li><a href="#">Resources for Effective and Safe Classroom Activities</a></li> <li><a href="#">Materials Supply List: Grade 1 Unit 3 Exploring Light and Sound</a></li> </ul>

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## Unit Opener

Page	Resource Links
18	Disciplinary Core Idea: <i>PS4.C Information Technologies and Instrumentation</i> <ul style="list-style-type: none"> <li>From the Framework:  <a href="#">Pages 136–137</a></li> </ul>
	Science and Engineering Practice: <i>1 Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>From the Framework:  <a href="#">Pages 54–56</a></li> </ul> <i>6 Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>From the Framework:  <a href="#">Pages 67–71</a></li> </ul>
	Connection to Engineering, Technology and Applications of Science <a href="#">Influence of Engineering, Technology, and Science on Society and the Natural World</a>
20	[VIDEO] <a href="#">Copland's "Hoe-Down"</a> [VIDEO] <a href="#">Gershwin's "Rhapsody in Blue"</a>

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## Lesson 1 Opener

Page	Resource Links
26	NGSS References <ul style="list-style-type: none"> <li>• <a href="#">DCI</a></li> <li>• <a href="#">CCC</a></li> <li>• <a href="#">SEP</a></li> </ul>

## Lesson 1, Segment 1

Page	Resource Links
27	Disciplinary Core Idea: PS4.A <i>Wave Properties</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 131–133</a></li> </ul>
	Science and Engineering Practice: 1 <i>Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 54–56</a></li> </ul>
	3 <i>Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul>
	6 <i>Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: 1 <i>Patterns</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 85–87</a></li> </ul>

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## Lesson 1, Segment 2

Page	Resource Links
33	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-1</a> <a href="#">Evidence Statements</a> for 1-PS4-1</li> </ul>
	Disciplinary Core Idea: PS4.A <i>Wave Properties</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 131–133</a></li> </ul>
	Science and Engineering Practice: <i>3 Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>

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## Lesson 1, Segment 3

Page	Resource Links
39	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-1</a> <a href="#">Evidence Statements</a> for 1-PS4-1</li> </ul>
	Disciplinary Core Idea: PS4.A <i>Wave Properties</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 131–133</a></li> </ul>
	Science and Engineering Practice: <i>3 Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul> <i>1 Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 54–56</a></li> </ul>
	Crosscutting Concept: 2 <i>Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>
41	[AUDIO] <a href="#">Sound Effects</a>
42	[VIDEO] <a href="#">See Vibrations Make Things Jump</a>

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## Online Resources

### Lesson 1, Segment 4

Page	Resource Links
45	Disciplinary Core Idea: PS4.A <i>Wave Properties</i> <ul style="list-style-type: none"><li>From the Framework: <a href="#">Pages 131–133</a></li></ul>
	Crosscutting Concept: 2 <i>Cause and Effect</i> <ul style="list-style-type: none"><li>From the Framework: <a href="#">Pages 87–89</a></li></ul>

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## Lesson 1, Segment 5

Page	Resource Links
53	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-1</a> <a href="#">Evidence Statements</a> for 1-PS4-1</li></ul>
	Disciplinary Core Idea: PS4.A <i>Wave Properties</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li></ul>
	Science and Engineering Practice: <i>1 Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 54–56</a></li></ul> <i>3 Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li></ul>
	Crosscutting Concept: 2 <i>Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li></ul>
55	[VIDEO] <a href="#">Jug Band</a>

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## Lesson 2 Opener

Page	Resource Links
60	NGSS References <ul style="list-style-type: none"> <li>• <a href="#">DCI</a></li> <li>• <a href="#">CCC</a></li> <li>• <a href="#">SEP</a></li> </ul>

## Lesson 2, Segment 1

Page	Resource Links
61	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <i>1 Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 54–56</a></li> </ul> <i>6 Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>
64	[VIDEO] <a href="#">Van Gogh’s “The Starry Night”</a>

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## Lesson 2, Segment 2

Page	Resource Links
67	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: 6 <i>Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: 2 <i>Cause and Effect</i> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 87–89</a></li> </ul>
69	[VIDEO] <a href="#">Fireflies</a> [VIDEO] <a href="#">More Fireflies</a>

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## Lesson 2, Segment 3

Page	Resource Links
72	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-2</a> <a href="#">Evidence Statements</a> for 1-PS4-2</li> </ul>
	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: 6 <i>Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: 2 <i>Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>
73	[VIDEO] <a href="#">Boy Reading with Flashlight</a>

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## Lesson 2, Segment 4

Page	Resource Links
77	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <i>6 Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 87–89</a></li> </ul>

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## Lesson 2, Segment 5

Page	Resource Links
90	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-2</a> <a href="#">Evidence Statements</a> for 1-PS4-2</li></ul>
	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li></ul>
	Science and Engineering Practice: <i>2 Developing and Using Models</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 56–59</a></li></ul> <i>6 Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 67–71</a></li></ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li></ul>

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## Lesson 3 Opener

Page	Resource Links
97	NGSS References <ul style="list-style-type: none"> <li>• <a href="#">DCI</a></li> <li>• <a href="#">CCC</a></li> <li>• <a href="#">SEP</a></li> </ul>

## Lesson 3, Segment 1

Page	Resource Links
98	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <i>1 Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 54–56</a></li> </ul> <i>3 Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>
100	[VIDEO] <a href="#">Children Discovering Shadows</a>

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## Lesson 3, Segment 2

Page	Resource Links
104	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-3</a> <a href="#">Evidence Statements</a> for 1-PS4-3</li> </ul>
	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <i>1 Asking Questions and Defining Problems</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 54–56</a></li> </ul> <i>3 Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>

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## Lesson 3, Segment 3

Page	Resource Links
110	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-3</a> <a href="#">Evidence Statements</a> for 1-PS4-3</li> </ul>
	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <p><i>3 Planning and Carrying Out Investigations</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul> <p><i>4 Analyzing and Interpreting Data</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 61–63</a></li> </ul> <p><i>7 Engaging in Argument from Evidence</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Bottom of pages 71–74</a></li> </ul>
	Crosscutting Concept: 2 <i>Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>

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## Lesson 3, Segment 4

Page	Resource Links
117	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-3</a> <a href="#">Evidence Statements</a> for 1-PS4-3</li> </ul>
	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <p>3 <i>Planning and Carrying Out Investigations</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul> <p>4 <i>Analyzing and Interpreting Data</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 61–63</a></li> </ul> <p>6 <i>Constructing Explanations and Designing Solutions</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: <p>2 <i>Cause and Effect</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul> <p>6 <i>Structure and Function</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 96–98</a></li> </ul>

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## Lesson 3, Segment 5

Page	Resource Links
123	Performance Expectation: <ul style="list-style-type: none"> <li>• <a href="#">1-PS4-3</a> <a href="#">Evidence Statements</a> for 1-PS4-3</li> </ul>
	Disciplinary Core Idea: PS4.B <i>Electromagnetic Radiation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 133–136</a></li> </ul>
	Science and Engineering Practice: <i>3 Planning and Carrying Out Investigations</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 59–61</a></li> </ul> <i>6 Constructing Explanations and Designing Solutions</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 67–71</a></li> </ul>
	Crosscutting Concept: <i>2 Cause and Effect</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 87–89</a></li> </ul>
125	[VIDEO] <a href="#">Flashlight Beam Tag</a>

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## Lesson 4 Opener

Page	Resource Links
139	NGSS References <ul style="list-style-type: none"> <li>• <a href="#">DCI</a></li> <li>• <a href="#">CCC</a></li> <li>• <a href="#">SEP</a></li> </ul>

## Lesson 4, Segment 1

Page	Resource Links
140	Disciplinary Core Idea: PS4.C <i>Information Technologies and Instrumentation</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 136–138</a></li> </ul>
	Science and Engineering Practice: <i>8 Obtaining, Evaluating, and Communicating Information</i> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 74–77</a></li> </ul>
	Connection to Engineering, Technology and Applications of Science <a href="#">Influence of Engineering, Technology, and Science on Society and the Natural World</a>
142	[VIDEO] <a href="#">The Invention of Morse Code</a>

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## Lesson 4, Segment 2

Page	Resource Links
145	<p>Disciplinary Core Idea: PS4.A <i>Wave Properties</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 131–133</a></li> </ul> <p>PS4.B <i>Electromagnetic Radiation</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 133–136</a></li> </ul> <p>PS4.C <i>Information Technologies and Instrumentation</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 136–138</a></li> </ul> <p>ETS1.A <i>Defining and Delimiting Engineering Problems</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 204–206</a></li> </ul> <p>ETS1.B <i>Developing Possible Solutions</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 206–208</a></li> </ul> <p>ETS1.C <i>Optimizing the Design Solution</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 208–210</a></li> </ul>
	<p>Science and Engineering Practice: <i>1 Asking Questions and Defining Problems</i></p> <ul style="list-style-type: none"> <li>From the Framework: <a href="#">Pages 54–56</a></li> </ul>
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	<p>Disciplinary Core Idea:</p> <p>PS4.C <i>Information Technologies and Instrumentation</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 136–138</a></li> </ul> <p>ETS1.B Developing Possible Solutions</p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 206–208</a></li> </ul> <p>ETS1.C <i>Optimizing the Design Solution</i></p> <ul style="list-style-type: none"> <li>• From the Framework: <a href="#">Pages 208–210</a></li> </ul>
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	Connection to Engineering, Technology and Applications of Science <a href="#">Influence of Engineering, Technology, and Science on Society and the Natural World</a>

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