Online Resources

Investigating Forces

Click on each section link 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).

	About This Unit
Part A	Lesson 1
	Lesson 2
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Part B	Lesson 4
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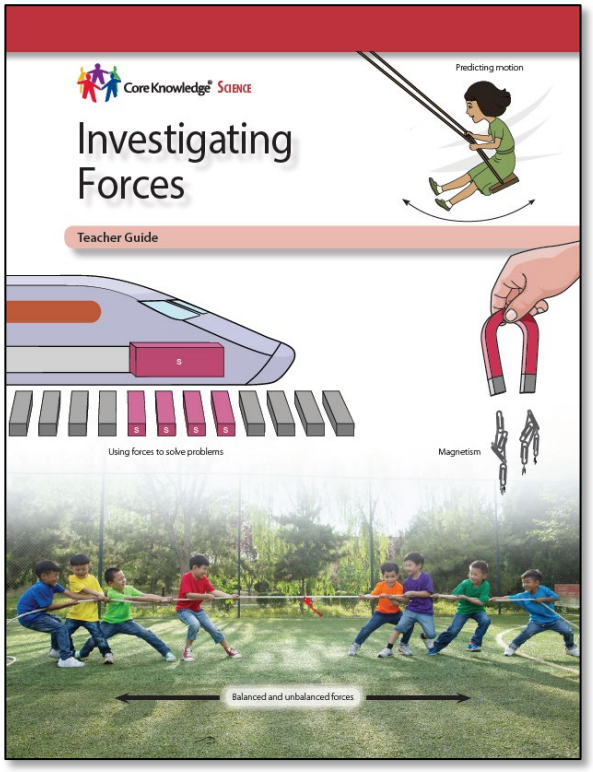
Part C	Lesson 6
Part D	Lesson 7
	Lesson 8
	Lesson 9
Unit Review & Assessment	UR Lesson
	Culminating Assessment
	Teacher Resources



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

About This Unit

Page	Resource Links
1	Note to Teachers and Curriculum Planners: • The learning progressions of Disciplinary Core Idea PS2.A *Forces and Motion* as well as PS2.B *Types of Interactions* offer guidance regarding the scope and sequence of learning about forces in the elementary grades and beyond. • Learn more about these core ideas and their related content by reading the corresponding section of *A Framework for K–12 Science Education:* pg. 114–118 See also the Teacher Resources section of this guide.
2	Notes to Core Knowledge Teachers: *2019 Core Knowledge Science Sequence* for this unit: Domain—Investigating Forces 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—3. Forces and Interactions • 3-PS2-1 • 3-PS2-2 • 3-PS2-3 • 3-PS2-4* ** Expectations that integrate engineering design practices and knowledge are noted above with an asterisk.* Learn more about the Next Generation Science Standards: Additional Resources to Understand the Three Dimensions of the Next Generation Science Standards
10	Resources for Effective & Safe Classroom Activities
11	Materials Supply List: Grade 3 Unit 1 Forces
13	Pacing Guides for CKSci Grades 3–5

← Table of Contents Lesson 1 →

Part A: Forces and Motion

Lesson 1

Page	Resource Links
17	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117
	Disciplinary Core Idea: PS2.B *Types of Interactions* • From the *Framework*: Middle of pg. 116–118
	Crosscutting Concept: *Cause and Effect* • From the *Framework*: Bottom of pg. 87–89
18	[IMAGE OPTIONS] "Sailing Stones" of Death Valley: • Stone trail • Aerial stone paths • Stone trail with ice
	[Know the Science] • Learn more about the "sailing stones" • [VIDEO] - Mystery of the Sailing Stones Solved

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Lesson 2

Page	Resource Links
22	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117
	Disciplinary Core Idea: PS2.B *Types of Interactions* • From the *Framework*: Middle of pg. 116–118
	Crosscutting Concept: *Cause and Effect* • From the *Framework*: pg. 86–89
26	[VIDEO] Girls and Boys Soccer Game

Lesson 3

Page	Resource Links
28	Performance Expectation: • 3-PS2-1 • Evidence Statements for 3-PS2-1
	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117
	Disciplinary Core Idea: PS2.B *Types of Interactions* • From the *Framework*: Middle of pg. 116–118
	Science and Engineering Practices: *Planning and Carrying Out Investigations* (SEP #3) • From the *Framework* pg. 59-61
	Crosscutting Concept: *Cause and Effect* • From the *Framework*: pg. 86–89

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Part B: Friction is a Force

Lesson 4

Page	Resource Links
35	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117 PS2.B *Types of Interactions* • From the *Framework*: Middle of pg. 116–118 PS3.D *Energy in Everyday Life* • From the *Framework*: pg. 128–130
	Science and Engineering Practices: *Planning and Carrying Out Investigations* (SEP #3) From the *Framework* pg. 59-61
	Crosscutting Concept: *Cause and Effect* • From the *Framework*: pg. 86–89
37	[VIDEO OPTIONS] • Why is Ice Slippery? • Slippery Sidewalk

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Part B: (continued)

Lesson 5

Page	Resource Links
42	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117
	Crosscutting Concept: *Patterns* • From the *Framework*: Middle of pg. 85-87
44	[IMAGE OPTIONS] • Boy Sitting On Slide 1 • Boy Sitting On Slide 2 • Girls About to Slide • A Mom Sliding on the Playground
46	[VIDEO OPTIONS] • Examples of Friction • Friction in Action [DEMO] • PBS "Curious Crew" Full Episode: Friction

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Part C: Predicting Motion

Lesson 6

Page	Resource Links
49	Performance Expectation: • 3-PS2-2 • Evidence Statements for 3-PS2-2
	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117
	Crosscutting Concept: *Patterns* • From the *Framework*: Middle of pg. 85-87
	Science and Engineering Practices: *Planning and Carrying Out Investigations* (SEP #3) • From the *Framework* pg. 59-61
50	[VIDEO OPTIONS] • Pendulum Clock • 2D and 3D Representation of Pendulums [EXTENSION/TEACHER REFERENCE] • Coupled Pendulums

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Part D: Magnetism is a Force

Lesson 7

Page	Resource Links
57	Performance Expectation: • 3-PS2-3 • Evidence Statements for 3-PS2-3
	Disciplinary Core Idea: PS2.A *Forces and Motion* • From the *Framework*: pg. 114–117
	Disciplinary Core Idea: PS2.B *Types of Interactions* • From the *Framework*: Middle of pg. 116-118
	Crosscutting Concept: *Cause and Effect* • From the *Framework*: pg. 86–89
	Science and Engineering Practices • Asking Questions and Defining Problems (SEP #1); From the *Framework* pg. 54-56

Lesson 8

Page	Resource Links
61	Disciplinary Core Idea: PS2.B *Types of Interactions* From the *Framework*: Middle of pg. 116-118
	Crosscutting Concept: *Cause and Effect* From the *Framework*: pg. 86–89
	Science and Engineering Practices Asking Questions and Defining Problems (SEP #1); From the *Framework* pg. 54-56

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Part D: (continued)

Lesson 9

Page	Resource Links
70	Performance Expectation: • 3-PS2-4 • Evidence Statements for 3-PS2-4
	Disciplinary Core Idea: PS2.B *Types of Interactions* • From the *Framework*: Middle of pg. 116-118
	Science and Engineering Practices • Asking Questions and Defining Problems (SEP #1); From the *Framework* pg. 54-56
	Crosscutting Concept: *Interdependence of Science, Engineering, and Technology* • From the *Framework*: Middle of pg. 210-212
74	[VIDEO OPTION] • Scrapyard Magnet

← Table of Contents Unit Review →

Unit Review and Assessment

UR Lesson

Page	Resource Links
78	NGSS Performance Expectations addressed by this unit: Topic—3. Forces and Interactions • 3-PS2-1 • 3-PS2-2 • 3-PS2-3 • 3-PS2-4* ** Expectations that integrate engineering design practices and knowledge are noted above with an asterisk.*
80	[ADVANCE PREPARATION: EXAMPLE PROJECT VIDEO] • Maglev Train Project Assembly NOTE: the materials used in this video are subtly different than those called for by the Teacher Guide (e.g., video uses rulers instead of a narrow cardboard box, and bar magnets instead of magnetic tape as specified by the lesson plan) *If time allows, consider supporting your students with a review of select image/video examples used in Lessons 1–9.* *Jump to the Table of Contents*

Culminating Unit Assessment

Page	Resource Links
110	Unit Assessment: Teacher Evaluation Guide

← Table of Contents Teacher Resources →

Teacher Resources

Page	Resource Links
3	Additional Resources to Understand the Three Dimensions of the Next Generation Science Standards
10	Resources for Effective & Safe Classroom Activities *(also, see below re: page 116)*
11	Materials Supply List: Grade 3 Unit 1 Forces
13	Pacing Guides for CKSci Grades 3–5
108	Activity Pages Answer Key
110	Unit Assessment: Teacher Evaluation Guide
116	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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