

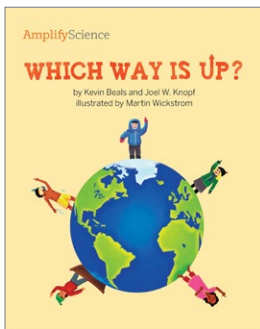
## Patterns of Earth and Sky: Analyzing Stars on Ancient Artifacts



ISBN: 978-1-939787-45-3  
Lexile Measure: 900L

### How Big Is Big? How Far Is Far?

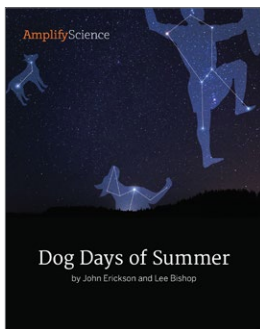
*How Big Is Big? How Far Is Far?* challenges students to reframe their ideas about size and distance. Beginning with a beluga whale, the book zooms out to bigger and bigger things, from blue whales to stars. Next, the book explores relative distances, starting with a familiar example—the distance between home and school—before moving to distances between astronomical objects. This book sets the context for the unit by orienting students to the nearly incomprehensible immensity of space and to some objects that they will investigate. It also helps prepare students to understand unit content as they think about the question of how distant and how huge stars actually are; they only look small because they are so far away.



ISBN: 978-1-943228-64-5  
Lexile Measure: 920L

### Which Way Is Up?

*Which Way Is Up?* with its clear text and simple illustrations, helps students explore the meaning of the directions up and down in various locations on our spinning, spherical planet. The book introduces the force of gravity, which causes Earth to pull everything toward its center. Various examples show that this pull is inescapable and always in the downward direction, up is the opposite, and gravity is measured by an object's weight. This book delivers essential content and supports students in understanding a key idea that is difficult to observe firsthand: What people on Earth see in the sky when they look up changes, and we do not all see the same thing at the same time. However, gravity is the constant force that helps people determine which way is up.



ISBN: 978-1-943228-70-6  
Lexile Measure: 940L

### Dog Days of Summer

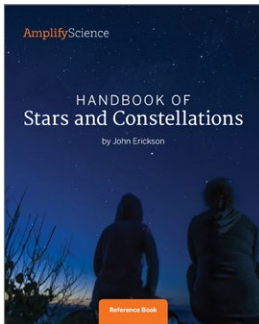
As they get to know Sirius, the Dog Star, students are introduced to several important concepts in *Dog Days of Summer*. They learn what a constellation is, the names of a few specific constellations, and some features of the brightest star in the night sky. Students read about astronomy ideas from ancient times that have been disproven through observation and investigation and how the Dog Star served as a guide to important events in the lives of ancient people. The book also explains why particular stars are visible during some parts of the year, but not others—it's all due to Earth's orbit. *Dog Days of Summer* helps students understand content about stars and constellations, as well as historical ideas in astronomy.



ISBN: 978-1-943228-72-0  
Lexile Measure: 960L

## Star Scientist

In *Star Scientist*, students meet Gibor Basri, an astronomer who investigates how stars form, how they change over time, and relationships between stars and planets. This book follows one particular investigation: Basri, along with a group of other scientists, gathered data to discover whether stars other than the sun have orbiting planets. Students read about Basri's process of deciding which data would help answer the question, gathering measurements using the Kepler telescope, creating models to compare different scenarios, and analyzing the data to arrive at a conclusion. This book models the investigative process for students, giving them a real-world example of how data can answer a fascinating astronomy question, but also how it can lead to new questions.



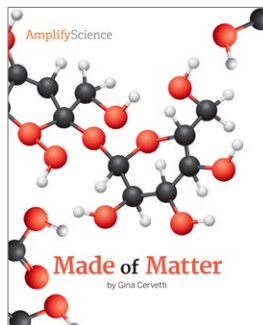
ISBN: 978-1-943228-74-4  
Lexile Measure: N/A

## Handbook of Stars and Constellations

*Handbook of Stars and Constellations* is the reference book for this unit. Students can look up specific constellations and astronomical objects, such as stars and nebulae. The book introduces constellations and some of the objects within them, then lists 28 constellations that students might be able to see for themselves, either with the unaided eye or a pair of binoculars. Each constellation entry includes a brief note about how it got its name, interesting facts, and viewing hints for its most visible objects. Star maps for each season of the year (in the Northern Hemisphere) are included so students can go outside at night and discover the constellations for themselves. Photos and diagrams throughout the book provide students with rich visual evidence. This book supports students' firsthand investigations, as they learn about the sun and constellations and when they are visible.

Reference Book

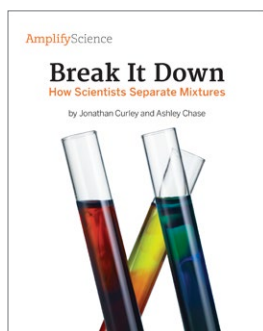
## Modeling Matter: The Chemistry of Food



ISBN: 978-1-943228-09-6  
Lexile Measure: 800L

### Made of Matter

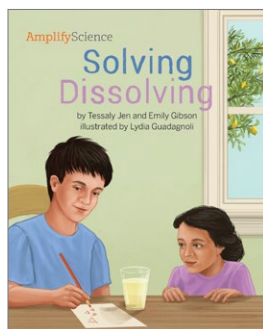
*Made of Matter* introduces students to several important concepts about matter. Students learn that everything around them is made of tiny particles called atoms and that atoms joined together are called molecules. By comparing different amounts of everyday materials, students get a sense of just how tiny atoms and molecules are. Students are introduced to models as representations of atoms and molecules and learn that all molecules of one kind are exactly the same. Students learn the difference between a substance and a mixture and that most matter is made of many different kinds of substances mixed together. They also learn that molecules can have different properties, which helps build the foundation for understanding why substances have different observable properties.



ISBN: 978-1-943228-10-2  
Lexile Measure: 800L

### Break It Down: How Scientists Separate Mixtures

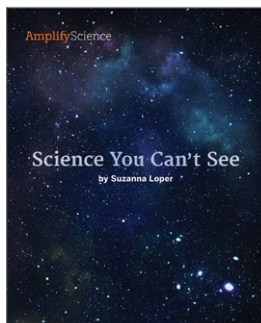
*Break It Down: How Scientists Separate Mixtures* discusses mixtures and the importance in science of being able to separate them into component substances. The book shows students three contexts in which separating a mixture is important: the separation of pure water from salty ocean water, plasma from blood, and the original ingredients from the remains of a meal found in an ancient tomb. Each example features a different separation technique. The book emphasizes that each technique uses the unique observable and molecular properties of the substances in the mixture in order to separate them. This helps reinforce students' understanding that the properties of a substance are determined by the properties of its molecules.



ISBN: 978-1-943228-15-7  
Lexile Measure: 690L

### Solving Dissolving

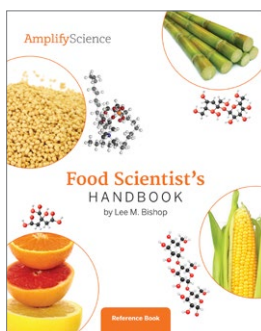
A boy named Diego helps his little sister, Maya, solve the mystery of the disappearing sugar in *Solving Dissolving*. As the siblings make lemonade, Maya notices that the sugar is no longer visible in the water when it's stirred. Using both observable evidence and nanoscale models, Diego proves that the sugar is dissolving, not disappearing. He helps Maya understand that the sugar is breaking apart into pieces that are too small to see: molecules. This exploration of dissolving helps students understand what is happening with their mixtures on a molecular level. In addition, it provides a clear example of using evidence and models to answer questions and explain phenomena that are not directly observable.



ISBN: 978-1-943228-11-9  
Lexile Measure: 900L

## Science You Can't See

*Science You Can't See* introduces students to the work of three scientists, each of whom studies a phenomenon that cannot be observed directly. Karen Chin studies dinosaurs, Edward Saade investigates the ocean floor, and Farid El Gabaly uses an electron microscope to make images of atoms. In order to answer their questions, these scientists must make inferences based on evidence rather than direct observations. *Science You Can't See* models an important aspect of the nature of science for students—making sound inferences based on evidence.



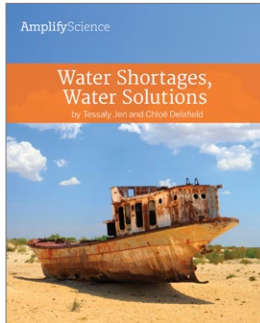
ISBN: 978-1-943228-17-1  
Lexile Measure: 860L

## Food Scientist's Handbook

Students learn about the nanoscale and observable properties of various food ingredients, and how food scientists use them, in *Food Scientist's Handbook*. They also learn about some common processes that food scientists use to change foods: heating, cooling, and mixing. Each ingredient page provides an introduction to the ingredient and its uses and includes a chart that helps students relate properties of the molecules in the ingredient to its observable properties. The process pages help students understand what is happening on a molecular level when ingredients undergo various changes, some reversible and some not. This latter section also introduces chemical reactions and some of the surprising changes that can occur when substances are involved in a chemical reaction. *Food Scientist's Handbook* provides a helpful resource for students to use throughout the unit as they explore their salad dressing mixtures.

Reference Book

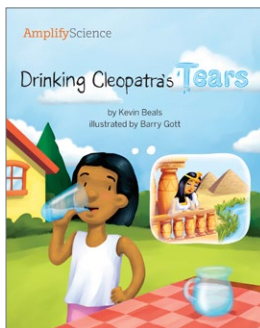
## The Earth System: Investigating Water Shortages



ISBN: 978-1-945192-49-4  
Lexile Measure: 880L

### Water Shortages, Water Solutions

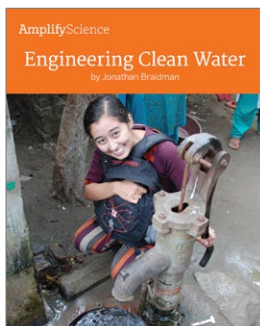
*Water Shortages, Water Solutions* presents six real-life water shortage situations to get students thinking about humans' relationship with Earth's limited freshwater resources. The examples highlight how drought, overuse, and pollution can cause water shortages, and drive home the idea that a water shortage is an insufficient amount of usable freshwater, not necessarily a lack of water in general. A central theme in the book is that when people use water, it often becomes unavailable for future use. It does not disappear from Earth, but often moves into a place or form that is not usable for people. The book describes examples of water shortages from the U.S. and around the world, as well as some of the ways people are addressing these shortages. This book sets the context for the unit and helps students connect ideas they learn about in the unit to authentic problems people are experiencing around the world.



ISBN: 978-1-945192-52-4  
Lexile Measure: 1000L

### Drinking Cleopatra's Tears

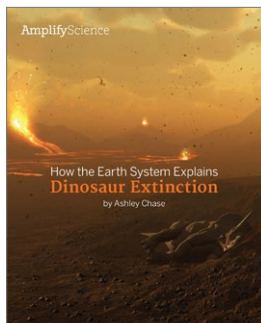
Filled with surprising and humorous examples of how water on Earth is recycled over time, *Drinking Cleopatra's Tears* emphasizes that water is continuously recycled on Earth through the water cycle. Diagrams in the book highlight the different phase changes (evaporation and condensation) that water goes through as it travels around Earth and in the atmosphere. This book helps students review and apply their growing knowledge of the water cycle and also lays the groundwork for understanding conservation of matter. *Drinking Cleopatra's Tears* reinforces concepts such as water vapor, condensation, and evaporation to help students connect ideas that they have learned from previous activities and start understanding how water from a lake can become a raindrop...or how water from Niagara Falls can end up in a squirt gun. The book provides context for students' investigations by helping them see how evaporation and condensation happen continuously all over Earth.



ISBN: 978-1-945192-55-5  
Lexile Measure: 940L

### Engineering Clean Water

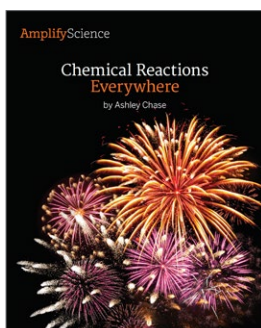
*Engineering Clean Water* profiles two engineers who worked with a team to improve access to clean water in Dhaka, Bangladesh. One of the engineers was Bangladeshi, and the other was a visitor from the United States. Together, the engineers designed an inexpensive, easy-to-use water pump attachment that cleaned contaminated water at the point of use. Their design improved health outcomes for many residents of crowded areas in Dhaka by affording them access to clean drinking water at their neighborhood pumps. The book addresses each step of the design cycle in detail, with passages describing the engineers learning about the problem and then planning, making, and testing their designs. This book emphasizes that engineers iterate by going through the steps of the design cycle repeatedly to improve their designs. Students will be able to apply this understanding of design iteration to their own work as they improve their freshwater collection system designs.



ISBN: 978-1-945192-70-8  
Lexile Measure: 910L

## How the Earth System Explains Dinosaur Extinction

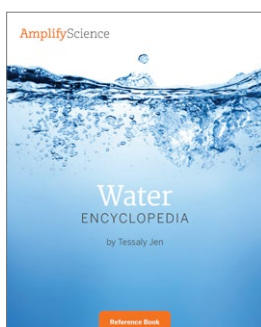
*How the Earth System Explains Dinosaur Extinction* is a book about how the parts of the Earth system—the hydrosphere, biosphere, geosphere, and atmosphere—interact. The explanation of how the dinosaurs could have gone extinct 65 million years ago provides a fascinating lens through which to view Earth system interactions. The book describes each of the Earth system's parts in detail, followed by the step-by-step explanation of how the interactions between parts could have caused the extinction of the dinosaurs. This explanation is presented as a chain of interactions: Changes in one part caused changes in another part, which caused changes in another part, and so on. The book provides context for students' investigations of the Earth system by helping them make connections between what they have been learning in class and a fascinating event in the history of Earth. It also encourages them to consider the many ways that Earth's parts interact.



ISBN: 978-1-945192-15-9  
Lexile Measure: 730L

## Chemical Reactions Everywhere

*Chemical Reactions Everywhere* uses familiar examples to convey that chemical reactions happen everywhere around us. The book explains that everything in the world is made of chemical substances, and that when a chemical reaction happens, at least one new substance with new properties forms. Twelve familiar chemical reactions are featured, and evidence of each chemical reaction—taste change; color change; temperature change; or the production of gas, light, or electricity—is identified. This book puts chemical reactions into the context of students' everyday lives through the engaging text and photographs. It also serves to launch students' investigations of chemical reactions as they consider how chemical reactions could play a role in their designs for wastewater treatment systems.



ISBN: 978-1-945192-74-6  
Lexile Measure: N/A

## Water Encyclopedia

Students learn about the distribution of water on Earth, the phases of water, water treatment, and much more in *Water Encyclopedia*. As an encyclopedia, the book covers many different aspects of water. Its alphabetized entries provide an easy way for students to search for specific information when they need it. *Water Encyclopedia* is a helpful resource for students to use throughout the unit as they investigate what causes water shortages, why different places get different amounts of rain, and what people can do to solve problems with water availability.

Reference Book

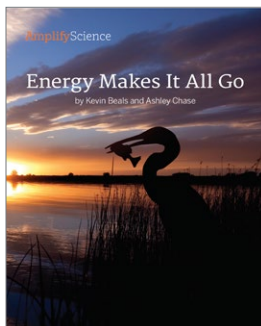
## Ecosystem Restoration: Matter and Energy in a Rain Forest



ISBN: 978-1-943228-51-5  
Lexile Measure: 900L

### Matter Makes It All Up

*Matter Makes It All Up* explores the fundamental concept that everything in an ecosystem—each living and nonliving part—is made of matter. Through engaging examples, students learn that matter makes up everything and that matter itself is made of atoms and molecules. The book also introduces the idea that matter moves through ecosystems. Using the example of an alligator in the Everglades Swamp ecosystem, the book follows how matter from what the alligator eats becomes part of its body as it grows and thrives in its environment. As matter is traced through the ecosystem, students learn that ecologists use food webs to show the movement of matter in an ecosystem from one organism to another. This book sets the context for the unit and introduces vocabulary and concepts that will be used extensively throughout the unit. It also delivers essential content—the idea that everything is made of matter—that is difficult to observe firsthand.



ISBN: 978-1-943228-54-6  
Lexile Measure: 950L

### Energy Makes It All Go

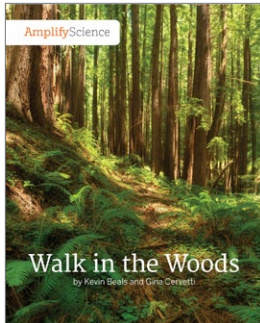
*Energy Makes It All Go* drives home the idea that nearly all energy on Earth ultimately comes from the sun. This energy moves through ecosystems as plants make their own food and, in turn, as animals eat plants and other animals. Organisms use this energy to grow, move, reproduce, and eat. The book explains how plants make food by using energy from sunlight and how that food may then become part of the bodies of herbivores and omnivores, which may then become part of the bodies of carnivores and omnivores. The book also introduces decomposers and their role in an ecosystem and challenges the reader to use what they have learned to think about the classification of a few organisms that are hard to categorize. Students learn that living things get their energy in different ways, but the source of that energy is almost always the sun. This book delivers content that will enrich students' understanding of ecosystems and support their investigations.



ISBN: 978-1-943228-58-4  
Lexile Measure: 960L

### Why Do Scientists Argue?

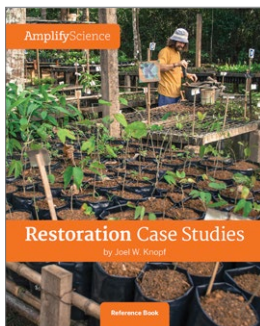
*Why Do Scientists Argue?* delves into the scientific practice of argumentation and details how and why arguments are so important to scientists. The book's unique format provides both information about the scientific community in general and a specific example of argumentation in action—the work of ecologist Rachel Carson. Left-hand pages tell the story of Carson's work, while right-hand pages place that story in the context of argumentation within the scientific community at large. The book follows Carson as she gathers evidence that supports her claim that pesticides cause damage to entire ecosystems, not just the insects they were designed to stop. Even though her claim was different from what most other scientists thought at the time, Carson convinced others that her claim was correct by supporting it with extensive evidence. This argument helped convince people to stop using some of the most harmful pesticides. Along the way, the text introduces the idea of the scientific community, which includes scientists all over the world who share information and ways of thinking and who argue with one another to move science forward. Students use this book to connect a real-world example of scientific argumentation to their own experiences making arguments about ecosystems. This book provides a rich model of scientific argumentation in action, as well as the communication skills and persistence required to participate in the scientific community.



ISBN: 978-1-943228-53-9  
Lexile Measure: 960L

## Walk in the Woods

*Walk in the Woods* follows a soil scientist named Asmeret Asefaw Berhe as she walks through the woods making observations. Berhe finds evidence of soil being formed from different kinds of matter. She knows that soil is a system made of different kinds of matter including 1) nonliving things such as rocks, 2) living things, and 3) the remains of dead organisms. Berhe looks for decomposers on the walk and describes the evidence that she sees of different kinds of common decomposers. *Walk in the Woods* provides students with an example of a real scientist who is looking for firsthand evidence in the natural world and investigating to find the answers to science questions. Students use this book to understand what kinds of matter make up soil as they begin to investigate the relationship between soil and plant growth. It also brings the forest ecosystem into the classroom through vivid photographs and descriptions. This book offers a compelling model of scientific inquiry skills, including careful observation and making inferences.



ISBN: 978-1-943228-56-0  
Lexile Measure: N/A

## Restoration Case Studies

*Restoration Case Studies* provides students with several examples of ecosystem restoration projects taking place in the real world. Each case study includes a description of the ecosystem along with a diagram of a food web, an introduction to the problems in the ecosystem, and information about the restoration work that is going on. The book helps students understand that ecosystems are complex and that all parts of an ecosystem affect one another. When there is a problem in one part of an ecosystem, it can have repercussions for all the organisms in that ecosystem. Diverse examples of restoration plans expose students to several varied examples of ecosystems and help students understand a range of human-caused environmental problems. The emphasis throughout the book is on the innovative ways that people are trying to remediate these problems. At the end of each section, readers are encouraged to think creatively about how to restore various kinds of ecosystems. At several points throughout the unit, students refer to this book to read about restoration plans that might spark ideas they could apply to their own restoration plans for the Costa Rican rain forest. This book supports students' firsthand investigations by providing information they can use as they create their plans. It also offers an opportunity for secondhand inquiry, as students can analyze the data provided and develop their own claims.

Reference Book



# About the books

Each unit of Amplify Science K–5 includes five student books authored by the curriculum experts at the University of California, Berkeley’s Lawrence Hall of Science. These age-appropriate books were built specifically to enhance students’ experiences in the Amplify Science curriculum. The books engage students with science phenomena that are too big, too small, too far, happen too slowly, or are too dangerous for students to engage with firsthand in the classroom, while reinforcing reading and literacy skills. These content-rich, nonfiction and informational texts provide opportunities for students to search for evidence relevant to their firsthand investigations, see science practices and dispositions modeled, extend their science knowledge, and provide real world connections as they master reading-to-learn, and close reading skills, and construct evidence-based arguments. The five books in each unit include one book for approximately every five days of instruction and one reference book that students draw upon throughout the 20-lesson units.



**THE LAWRENCE  
HALL OF SCIENCE**  
UNIVERSITY OF CALIFORNIA, BERKELEY

The program is designed to provide strong support in how to read like a scientist and for the development of vocabulary, language, and reading comprehension particularly relevant to reading informational text. It can serve as a complement to an English Language Arts program that addresses other literacy components (e.g., skill-based or fluency-oriented literacy instruction). Big books come with the program for all titles in grades kindergarten and 1.

## Lexile Levels

The Lexile<sup>1</sup> measure is provided for all non-reference books.<sup>2</sup> At this time, our reference books are not given Lexile measures because these books are not designed to be read from cover to cover; rather, students use these books to find targeted information to support their investigations. All books in the Amplify Science program fall within, or in a few cases, just outside, the range of Lexile measures specified for the grade level.

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- 1 Target Lexile measures by grade band are specified by the Common Core in Supplemental Information for Appendix A of the Common Core State Standards for English Language Arts and Literacy: New Research on Text Complexity, available at <http://www.corestandards.org/wp-content/uploads/Appendix-A-New-Research-on-Text-Complexity.pdf>. MetaMetrics further specifies target Lexile measures for each grade, available at <https://lexile.com/about-lexile/grade-equivalent/grade-equivalent-chart/>
  - 2 Lexile measures are available for the Grades 2–5 books; there are no current official Common Core recommendations for Lexile measures for kindergarten and Grade 1.