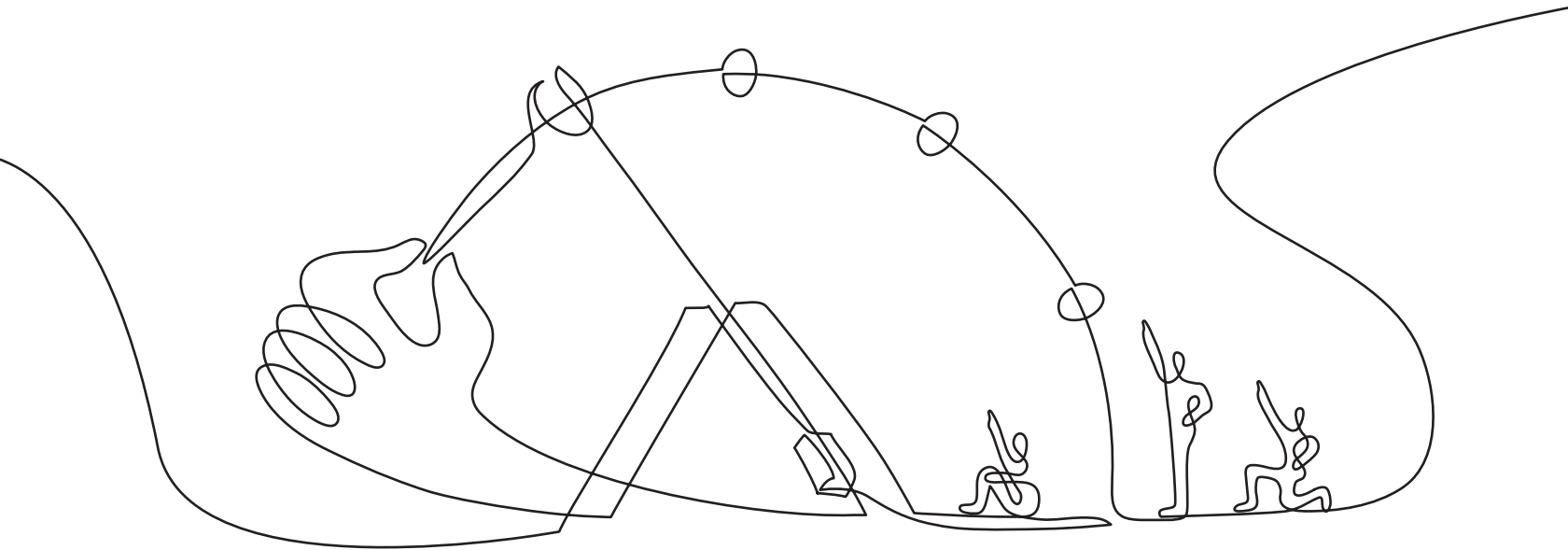


AmplifyScience

Grades K-5

Inspiring the next generation of
scientists, engineers, and curious citizens



authored by



THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

For today's students to be tomorrow's innovators and leaders, the 20th-century model of textbook-driven science education will not suffice. The complexities of 21st-century life require a revolutionary approach to science instruction that is real-world relevant and replaces rote memorization with critical thinking.

A collaboration between the curriculum experts at University of California, Berkeley's Lawrence Hall of Science and the instructional technology experts at Amplify, **Amplify Science for grades K-5** was built from the ground up to address the Next Generation Science Standards and three-dimensional learning, while developing students to become curious, skeptical, evidence-based thinkers.

A powerful partnership



University of California, Berkeley's Lawrence Hall of Science (LHS) has more than 40 years of experience improving K–12 science education. With 20 percent of K–12 classrooms using a Hall-developed instructional resource, and with legacy programs that include FOSS®, Seeds of Science/Roots of Reading®, GEMS®, SEPUP, and Ocean Science Sequences, the Hall's team has a deep understanding of what makes programs effective.

As the Hall's first K–5 science curriculum designed to address the new science standards, Amplify Science reflects state-of-the-art practices in science teaching and learning. Amplify's partnership with LHS runs through 2032 to ensure the program is continuously enhanced and updated.

Amplify.

Amplify has been pioneering K–8 digital education products for more than 15 years, empowering teachers across the country to personalize instruction for every student and to create thriving classroom communities of engaged learners.

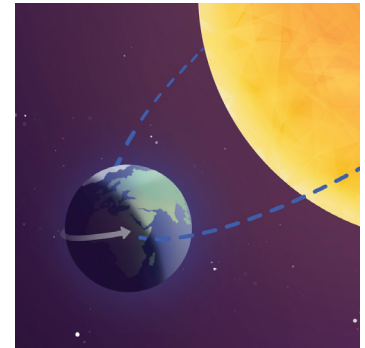
Amplify's award-winning core curriculum programs include Amplify CKLA, Amplify ELA, and Amplify Science. Amplify also recently launched a suite of supplemental products targeting essential skills: Amplify Close Reading, Amplify Fractions, and Amplify Vocabulary.

Amplify has supported more than 200,000 educators and three million students in all 50 states.

Built for new science standards and three-dimensional learning

The Next Generation Science Standards have raised the bar in science education. The new standards aim to move the focus of instruction away from memorization and toward active engagement. In their optimal implementation, the Next Generation Science Standards coach students to think like scientists and engineers, grapple with core scientific principles, and support deep learning of concepts that cut across domains.

We set out to create a science program that educators can use to bring three-dimensional science learning to life. Amplify Science is a robust, multimodal, hands-on program made to fulfill the new science standards, as well as a substantial number of ELA and math standards. Educators who adopt Amplify Science will have access to a comprehensive curriculum complete with detailed lesson plans, embedded assessments, hands-on activities and materials, digital simulations, and robust teacher support resources.





How Amplify Science meets new expectations for science teaching and learning:

- Students develop expertise in all Practices and deep understanding of Disciplinary Core Ideas and Crosscutting Concepts through repeated experiences within a wide variety of contexts.
- Foundational scientific phenomena, explored through diverse interdisciplinary contexts, ground student progress in cross-domain content and learning.
- Students gather evidence through firsthand investigations and digital sources, as well as by searching for relevant information in science books. Using evidence from these multiple sources, even the youngest students are able to construct causal explanations of real-world problems.
- Modeling tools empower students to create, and later revise, visualizations of their understandings of key scientific phenomena at critical points in the curriculum.
- Specific units focused on engineering and technology emphasize that there's not always one right answer, as students balance competing constraints to design the best justifiable solutions.



A unique, phenomena-based approach

In each Amplify Science unit, students are asked to inhabit the role of a scientist or engineer in order to investigate a real-world problem. These problems provide relevant, 21st-century contexts through which students investigate different scientific phenomena.

To investigate these phenomena, students collect evidence from multiple sources and through a variety of modalities. They move back and forth from firsthand

investigation to secondhand analysis and synthesis, formulating an increasingly complex explanation of the target phenomenon.

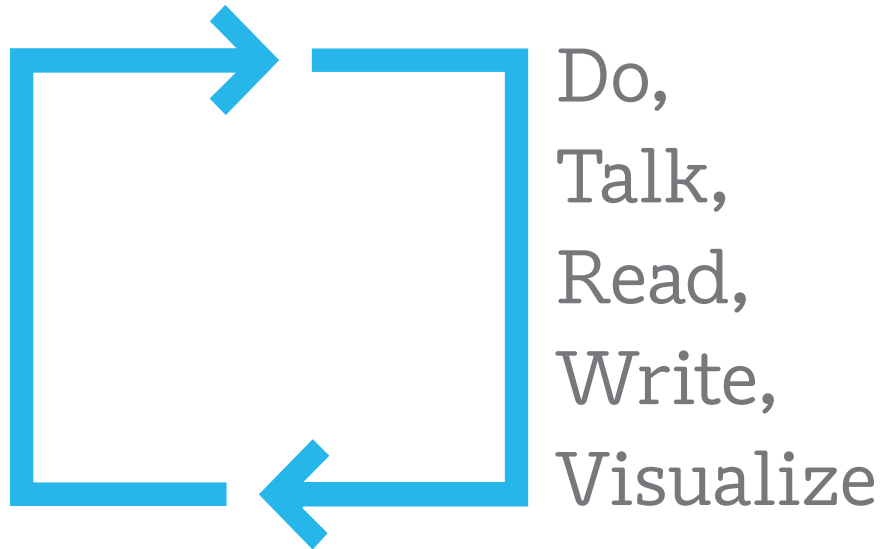
At the culmination of each unit, students have an opportunity to apply their newly acquired knowledge to a new problem. This enables students to demonstrate a deep understanding of the unit's key scientific phenomena.



“Amplify Science is very highly engaging for my students. It builds a deep understanding of science concepts and phenomena, while creating a strong integration of all content areas.”

—John, elementary school science teacher

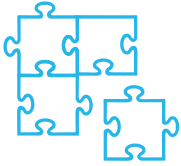
Instructional model



Amplify Science is rooted in the research-based, iterative [Do, Talk, Read, Write, Visualize](#) model of learning. Three third-party gold standard studies provide evidence that students who learn through the Do, Talk, Read, Write, Visualize approach (used in the Seeds of Science/Roots of Reading® program, which formed the foundation for the Amplify Science approach) saw the following benefits:

- Students using a Do, Talk, Read, Write approach significantly outperformed other students receiving their usual science instruction in the areas of science content knowledge and science vocabulary.
- English Language Learners (ELLs) significantly outperformed other ELLs in science content knowledge and science vocabulary.

For more information, please see scienceandliteracy.org/research/efficacy_studies.



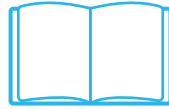
Do

First-hand investigations are an important part of any science classroom, and Amplify Science has students getting hands-on in every unit, from designing mixtures to experimenting with electrical systems.



Talk

Student-to-student discourse and full class discussions are an integral part of the program. Students are provided with numerous opportunities to engage in meaningful oral scientific argumentation, all while fostering a collaborative classroom environment.



Read

Five science books for each unit enable students to search for evidence related to their investigations and to practice the use of comprehension strategies for making sense of informational text.



Write

Following real-world practices, students write scientific explanations and arguments based on evidence they've collected making clear how their reasoning connects the evidence to claims.



Visualize

Manipulating digital simulations and using modeling tools to craft visualizations of their thinking—just as real scientists and engineers do—students take their learning far beyond the confines of what they can physically see in the classroom in an exciting and authentic way.



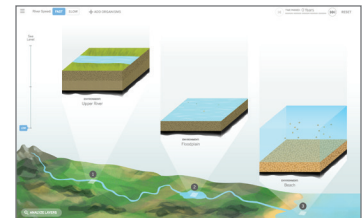
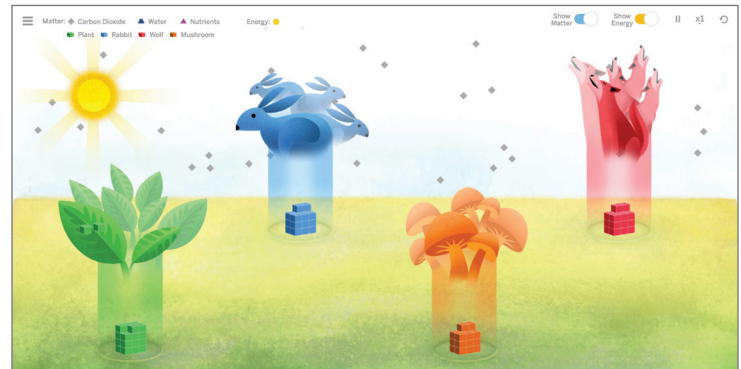
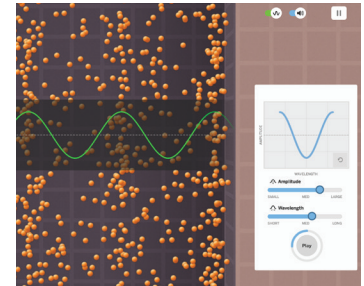
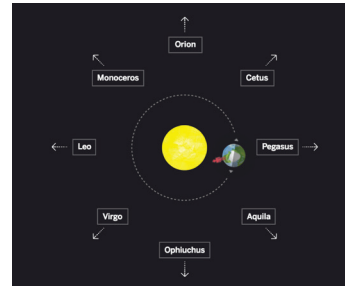
Immersive experiences

Every unit in Amplify Science has students taking on the role of a scientist or engineer in order to investigate a real-world, phenomena-based problem. Students make the leap from “learning about” to “figuring out” scientific concepts by exploring them in depth. Through a variety of immersive experiences, both physical and digital, students conduct investigations, create and critique models, and gather evidence to support claims.

Digital simulations

Commonly referred to as “sims,” digital simulations are digital tools that serve as venues of exploration and a means for collecting data and evidence, providing students with opportunities to make observations and manipulate variables of key scientific processes and mechanisms.

Sims allow students to explore scientific concepts that might otherwise be invisible or impossible to see with the naked eye. Much like real scientists do, students of Amplify Science will use these computer simulations to gain insight into processes that occur on the microscopic scale, or alternatively, to speed up processes that might otherwise take thousands or millions of years to observe.





Hands-on activities

Hands-on learning is at the heart of Amplify Science, and is integrated into every unit. Each hands-on activity provides clear instructions for the teacher, as well as easily accessible materials in unit-specific kits.

Each kit contains hands-on materials, both consumable and nonconsumable, and various print materials (e.g., Vocabulary and Key Concept cards). Each kit supplies sufficient materials for two uses by a class of 36 students.

With Amplify Science, students are able to actively participate in science, gathering evidence, thinking critically, making observations, and communicating their claims.

“I liked how we would work together because working together is a large part of science. I feel like I am learning more when we do hands-on experiments.”

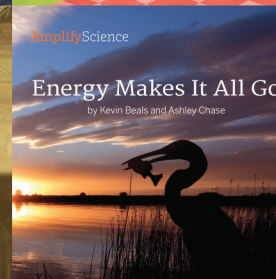
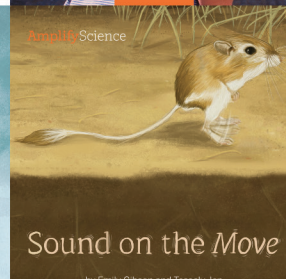
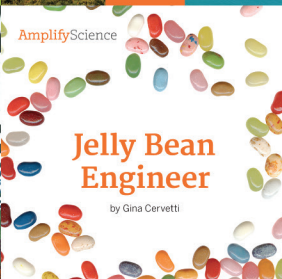
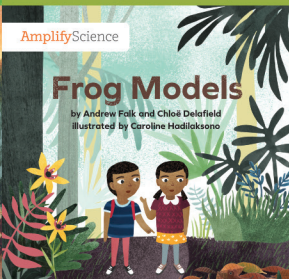
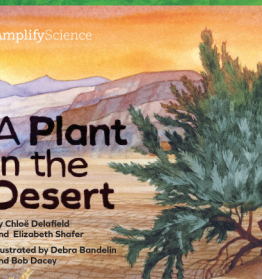
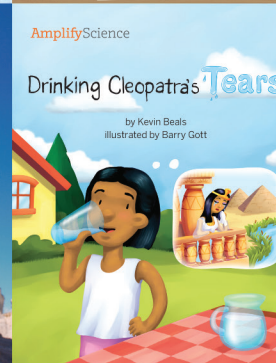
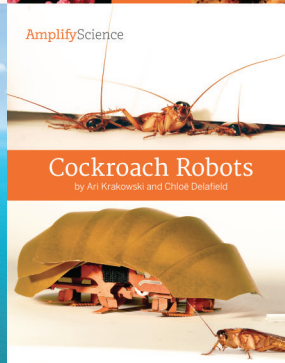
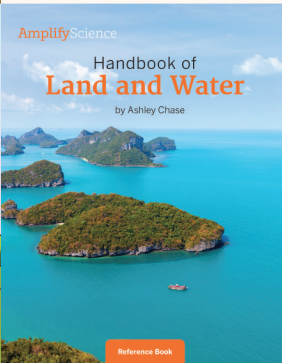
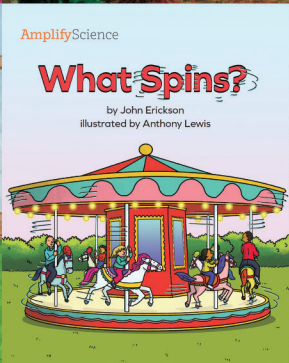
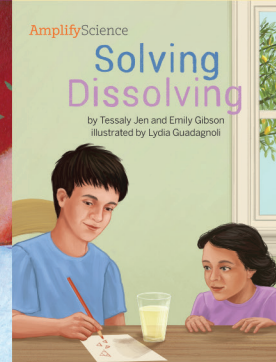
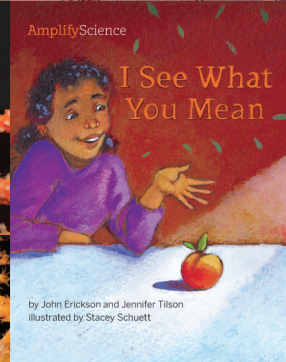
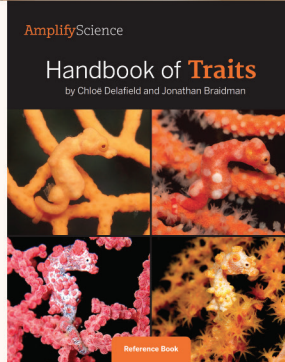
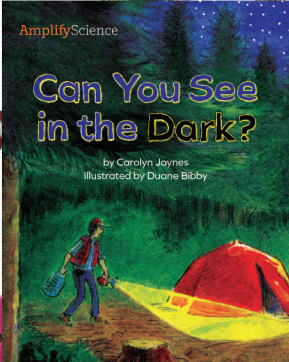
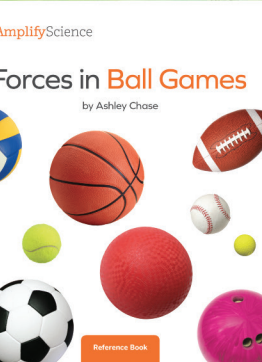
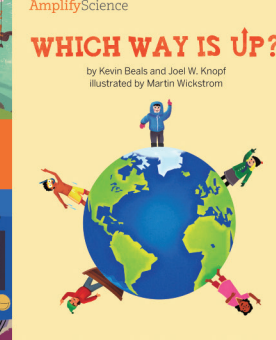
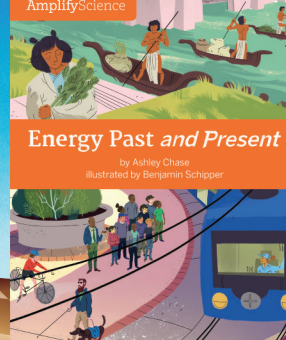
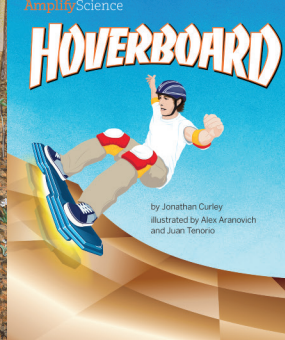
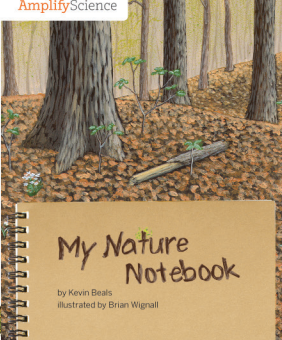
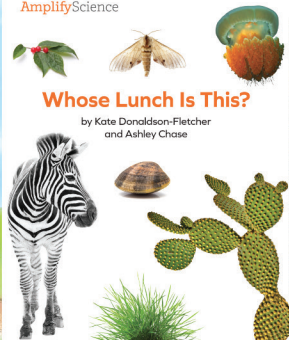
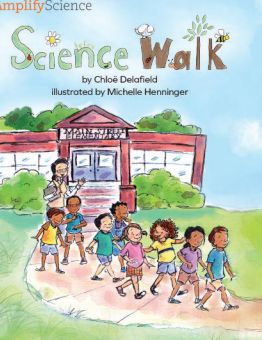
—Amplify pilot student

Reading integration

Integration of literacy into the Amplify Science program also comes in the form of student readers. Through a suite of readers built specifically to enhance the Amplify Science curriculum, students are able to develop reading, writing, and communication skills while learning about real-world science.

The award-winning, age-appropriate student readers in Amplify Science allow students to engage with content-rich text, obtain evidence, develop research and close reading skills, and construct arguments and explanations about the ideas they are learning in class.





A focus on literacy

New standards and three-dimensional learning have expanded what it means to be scientifically proficient. As a result, one third of science and engineering practices address English language arts. These include constructing explanations, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Scientists need to be able to read scientific texts and share written and oral information with their scientific peers, and Amplify Science puts students on a path to do exactly that.

Amplify Science provides instructional support for literacy, and provides instructions on how to read science texts, write science texts and engage in science talk. In Amplify Science, students “don’t just read the books and answer the questions.” Rather, students participate in a process called Active Reading using science articles written by the Lawrence Hall of Science. Active Reading means that students go into their reading activities with a purpose. They go into their reading looking for pieces of evidence to support their scientific argument, or, perhaps more importantly, students are explicitly instructed to ask questions as they read and record those questions.



Support for all learners

Amplify Science has embedded instructional supports that allow teachers to differentiate their instruction in order to reach every student in their classroom. The program provides scaffolding strategies for teachers in every lesson to help ensure that students with different levels of experience and understanding engage successfully with the lessons. Whether providing support for struggling students, advanced learners, or students needing extra language support, Amplify Science has embedded strategies that will help teachers reach all their learners.

English language learner support

Amplify Science includes embedded teacher and student supports in every lesson of every unit. These supports include empirically-based strategies and methods to ensure that EL students are able to have access to the same content as their native English-speaking peers.

Suggested EL modifications come in two categories:

1. Relatively small alterations and/or additional scaffolds that provide students with greater access to the content. These are the kinds of scaffolds that benefit all learners, including suggestions about how to provide graphic organizers, practice with multiple-meaning words, etc.
2. EL-specific strategies such as English/Spanish glossaries, native language supports, and provision of cognates and other content-specific language scaffolds in each unit.

Spanish language support

Amplify Science is committed to meeting the needs of all learners, and provides multiple access points for Spanish-speaking students. Developed in conjunction with Spanish experts and classroom teachers, Amplify Science provides multiple Spanish language components across our curriculum.

A partnership with educators

Supporting teachers from day one

Curriculum should be more than a dropped-off kit and list of instructions. At Amplify Science, we view ourselves as partners with each district, school, and teacher, united in our goals of addressing the new science standards and developing students to be skeptical, curious, evidence-based thinkers. From an online teacher's guide and lesson-specific differentiation strategies to robust professional development, teachers of Amplify Science feel comfortable, confident, and excited to teach. We serve as a nimble, responsive partner throughout implementation to ensure success in making the transition to three-dimensional science teaching and learning.

Professional learning options

Amplify Science offers a range of professional learning options, delivered by the Lawrence of Hall of Science team, to help launch the program and make it successful over the duration of use. Options for teacher professional learning range from onsite workshops that can last for several consecutive days to flexible remote webinars.





We provide teachers with the following embedded supports as part of the Amplify Science program:

- An online teacher's guide
- Step-by-step lesson instructions
- Suggested modifications to customize lessons for different settings
- Expected student responses
- Clear standards alignment
- Implementation support videos
- A help desk ready to respond to questions as they arise





Elementary curriculum

The scope and sequence of the program is designed to show that scientific concepts are interconnected and multifaceted. Each unit focuses on a specific learning goal in the form of an overarching unit question. Rather than following linear steps in an experiment, the program leaves room for students to make connections across concepts and make their own discoveries. In this way, Amplify Science replicates the realities and ambiguities of scientific research and thinking.

Grade K

- Needs of Plants and Animals
- Pushes and Pulls
- Sunlight and Weather

Grade 3

- Balancing Forces
- Inheritance and Traits
- Environments and Survival
- Weather and Climate

Grade 1

- Animal and Plant Defenses
- Light and Sound
- Spinning Earth

Grade 4

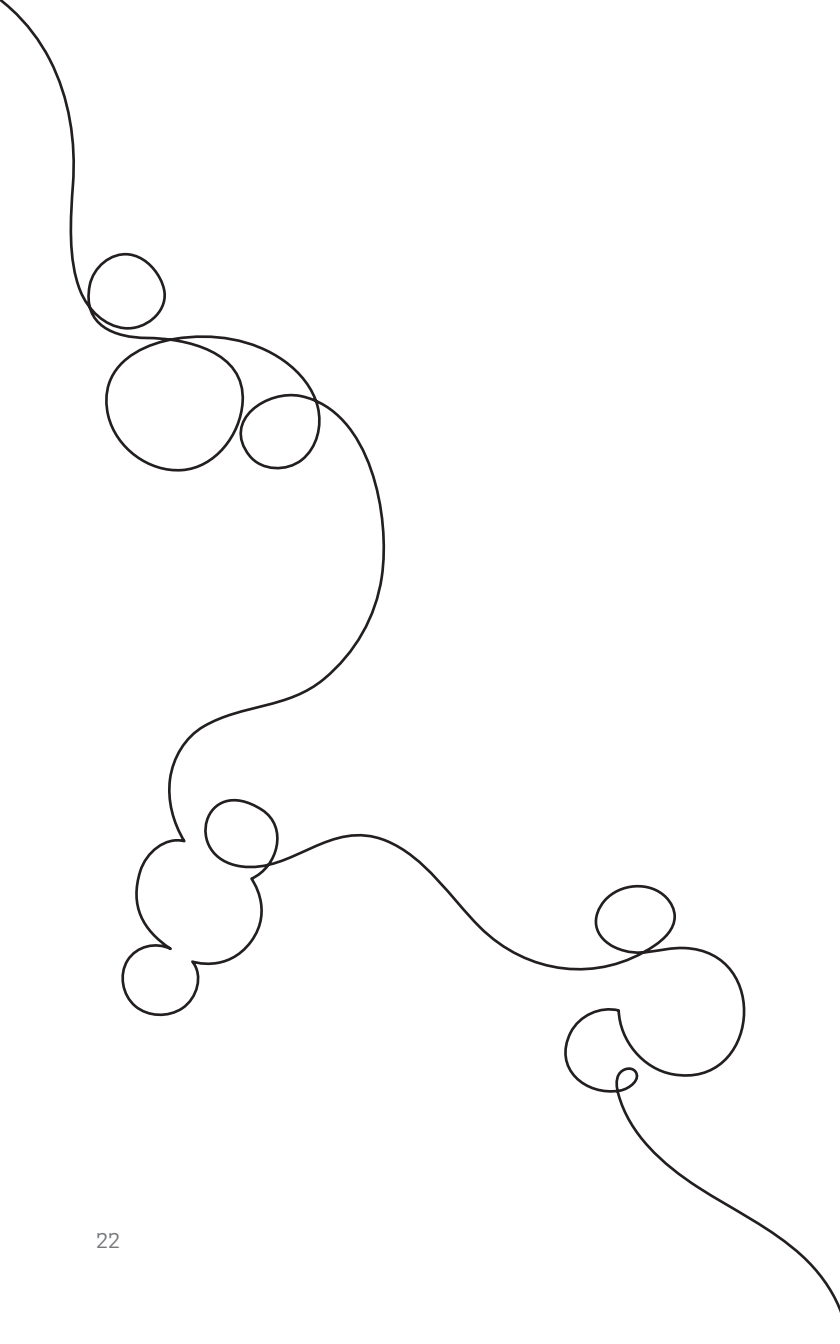
- Energy Conversions
- Vision and Light
- Earth's Features
- Waves, Energy, and Information

Grade 2

- Plant and Animal Relationships
- Properties of Materials
- Changing Landforms

Grade 5

- Patterns of Earth and Sky
- Modeling Matter
- The Earth System
- Ecosystem Restoration



For more information about our
K-8 science curriculum, visit:

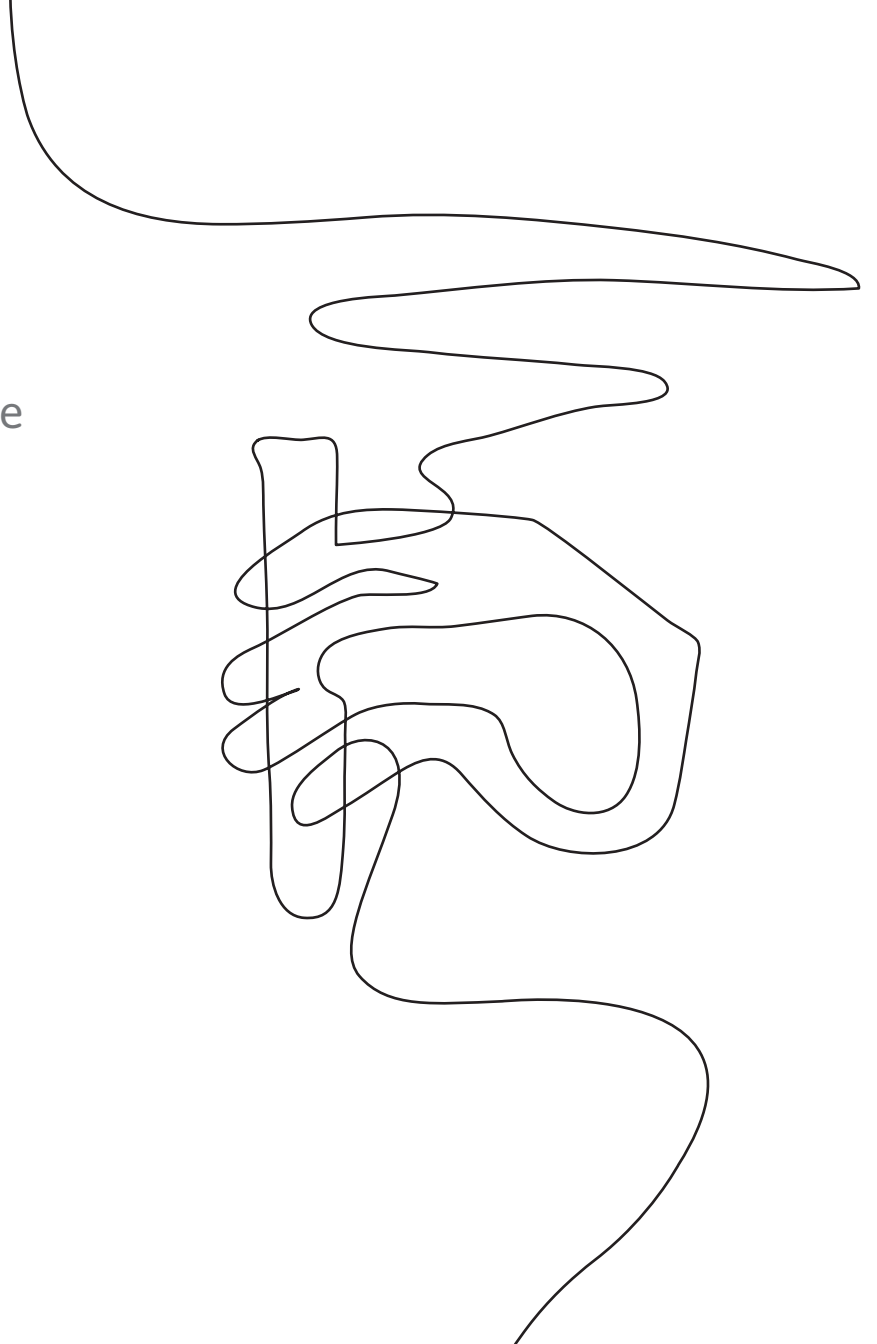
amplifyscience.com

To view a sample unit from our
K-5 program, visit:

amplify.com/science/sample

To get a demo and learn more
about the Amplify Science
curriculum for grades K-5,
get in touch:

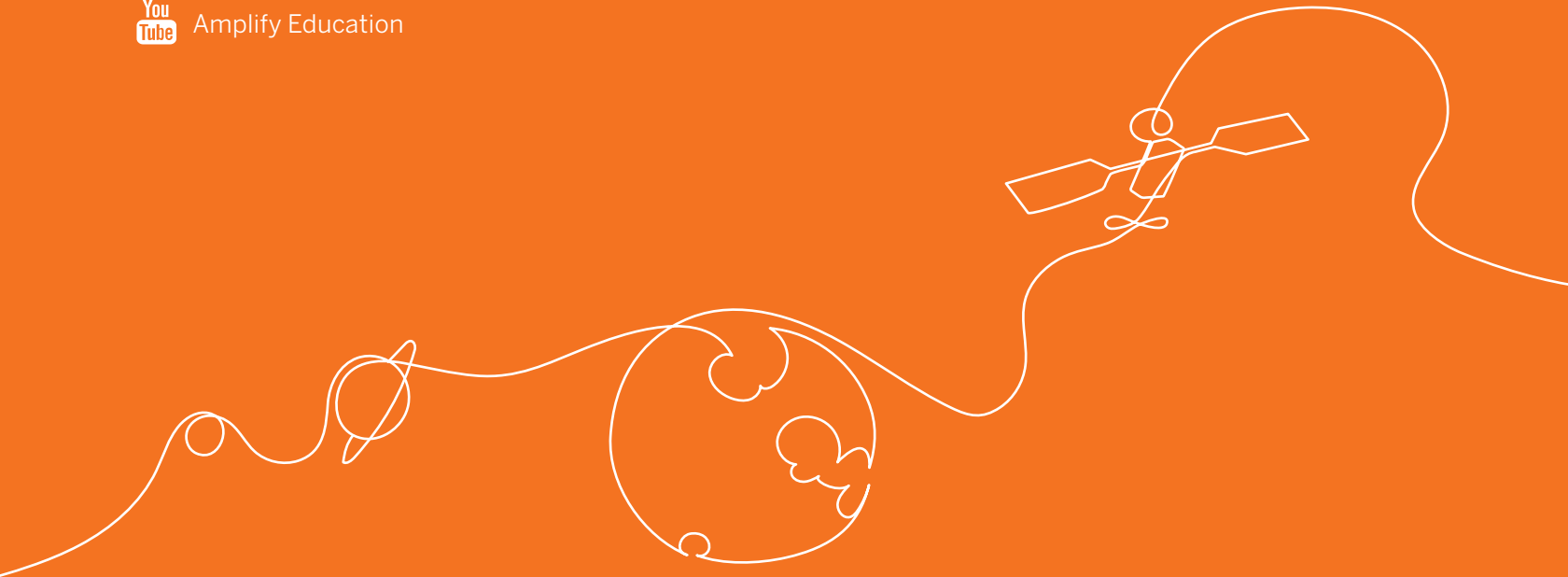
[\(800\) 823-1969](tel:(800)823-1969)



 @AmplifyScience

 Amplify Science

 Amplify Education



Amplify.



THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY