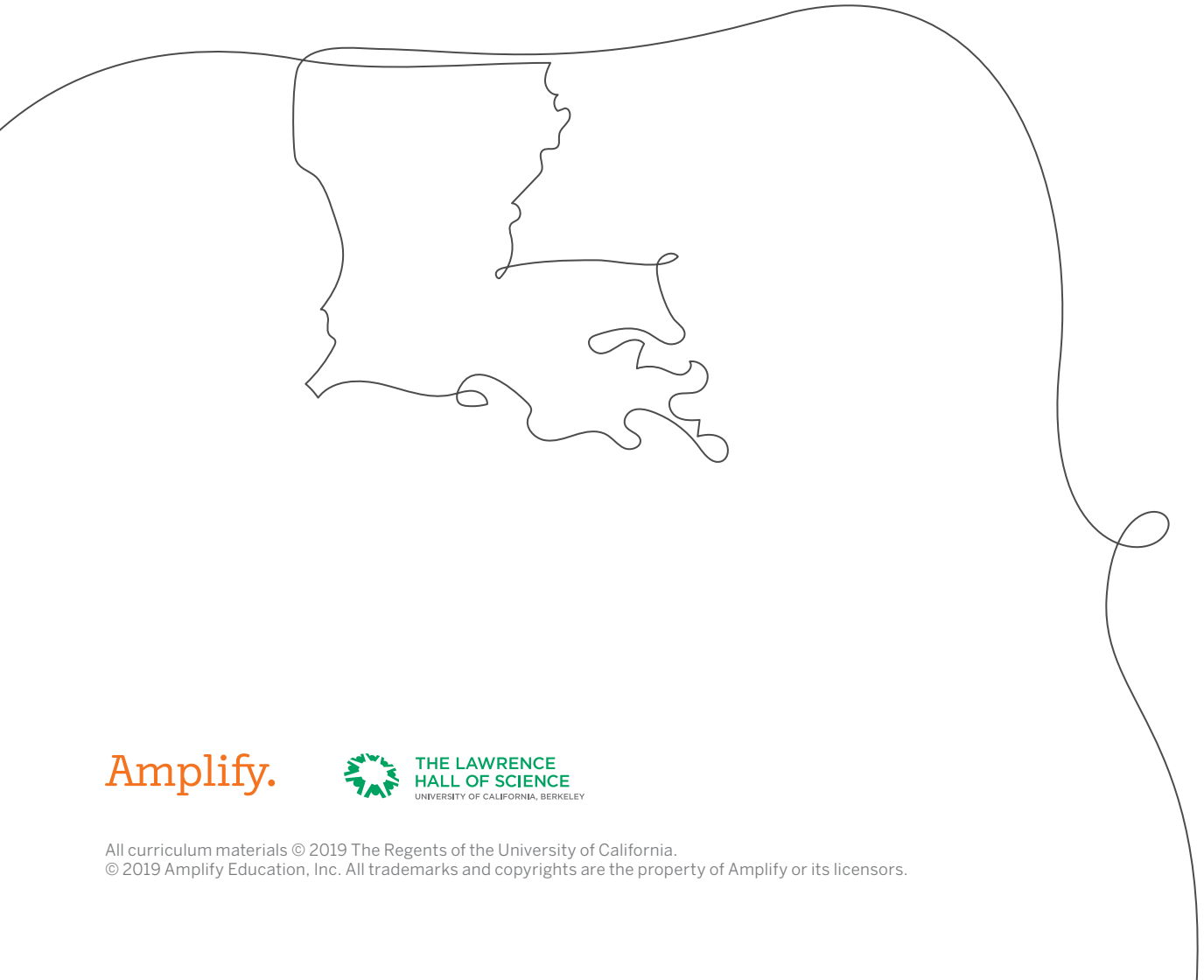
Amplify Science
LOUISIANA

Grades K–5

Program overview



Amplify.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

About Amplify Science Louisiana

Amplify Science is based on the latest research on teaching and learning, helping teachers deliver high-quality, literacy-rich instruction and enabling students to take on the roles of scientists and engineers to solve real-world phenomena every day.

In an Amplify Science classroom, students:

Collect evidence from a variety of sources.

- Hands-on investigations
- Physical models
- Interactive digital simulations
- Scientific texts
- Media (including video clips, photographs, maps, and data sets)

Make sense of evidence in a variety of ways.

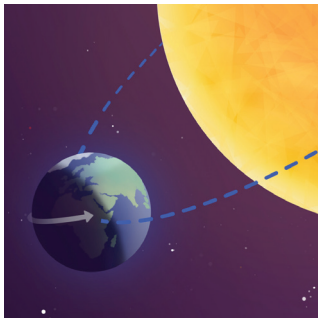
- Highlight and annotate texts
- Iteratively revise models
- Weigh the strength of scientific arguments
- Analyze trends in data sets
- Manipulate variables and record observations from digital simulations
- Discuss ideas and questions with classmates

Formulate convincing scientific arguments.

- Use evidence to support claims
- Construct and revise models and write sophisticated explanations
- Evaluate the strengths of competing claims

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:

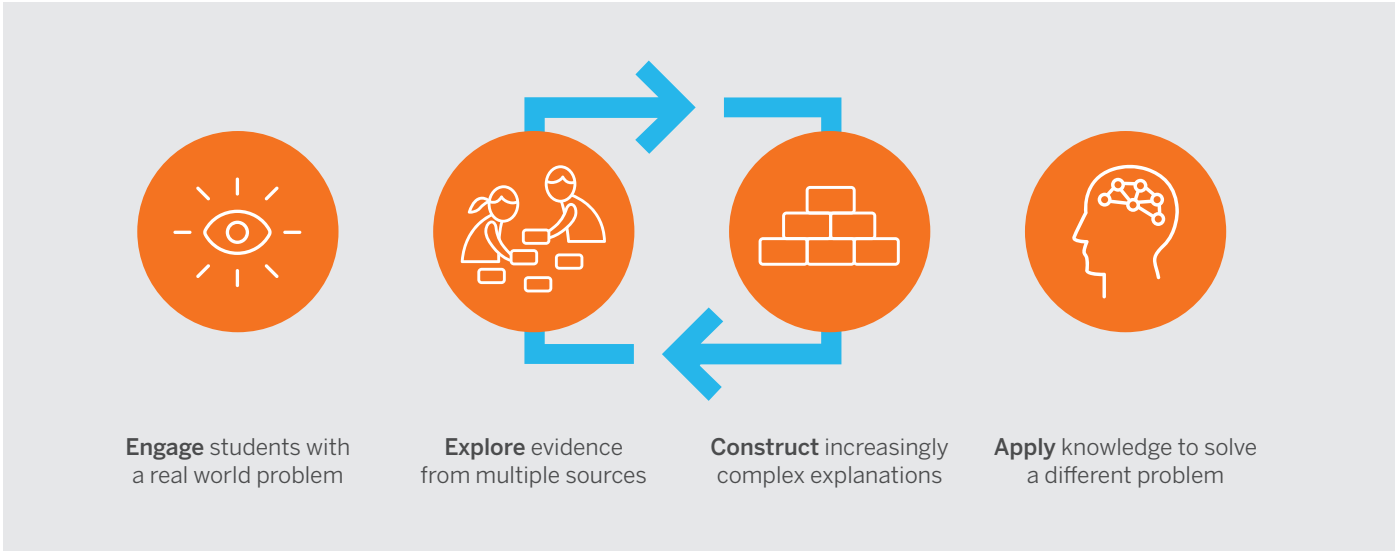
- Students develop expertise in all Practices and deep understanding of Disciplinary Core Ideas and Crosscutting Concepts through repeated experiences within a wide variety of contexts.
- Foundational scientific phenomena, explored through diverse interdisciplinary contexts, ground student progress in cross-domain content and learning.
- Students gather evidence through first hand 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.

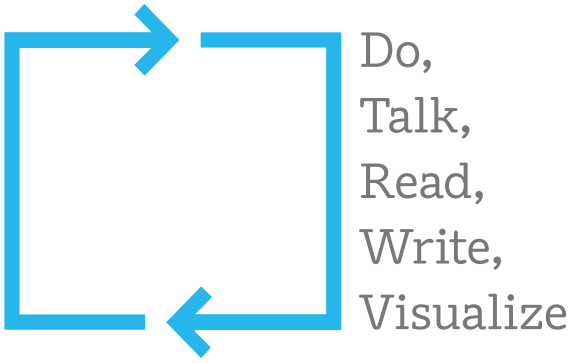
They move back and forth from firsthand investigation to secondhand analysis and synthesis, formulating an increasingly complex explanation of the target phenomenon. At the culmination of each unit, students have an opportunity to apply their newly acquired knowledge to a new problem. This enables students to demonstrate a deep understanding of the unit's key scientific phenomena.



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, Visualize 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



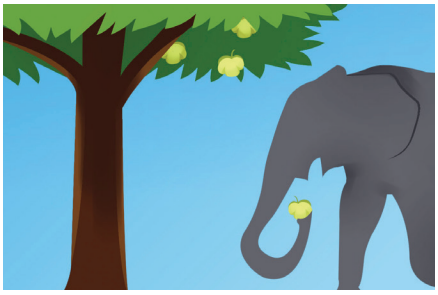
Course structure

Kindergarten

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

Grade 1

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

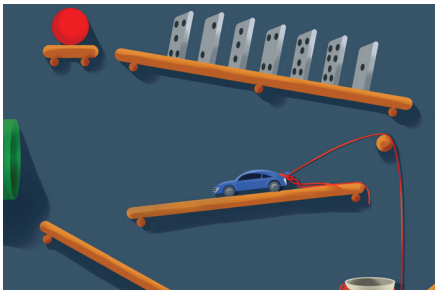


Grade 2

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

At grades K–2

- Grades K–2 include three units for a total of 66 days of instruction
- Each unit is made up of 20 lessons and two dedicated assessment days
- K–1 lessons are designed to take approximately 45 minutes
- Grade 2 lessons are designed to take approximately 60 minutes
- Students in grade 2 access media or digital tools in groups through the teacher account (you can find instructions for setting your students up with technology at **my.amplify.com/help**)



Grade 3

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

Grade 4

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

Grade 5

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

At grades 3–5

- Grades 3–5 include four units for a total of 88 days of instruction
- Each unit is made up of 20 lessons and two dedicated assessment days
- Lessons are designed to take approximately 60 minutes
- Students access media or digital tools in groups through the teacher account (you can find instructions for setting your students up with technology at **my.amplify.com/help**)

Key components

Print Digital

Teacher's Guide

The unit Teacher's Guide includes planning information and resources, step-by-step lessons, differentiation supports, and presentation resources.

Student Books

The Student Books are referenced in the instruction and serve as one of multiple sources of information for students as they gather evidence.

> 18 copies of each title included in each unit kit; digital classroom licenses available

Student practice apps and modeling tools

For students in grades 2–5, the digital student practice apps and modeling tools help students with modeling, graphing, and sorting information.

For students in grades 4–5, simulations, or "sims," are interactive, virtual worlds that allow students to discover and construct understanding of science concepts and phenomena. There is one simulation in grade 3.

> Available to students through purchase of the digital Teacher's Guide

Student Investigation Notebooks

The unit Student Investigation Notebook is the place where students record their observations and thinking. The notebook contains scaffolding supports for reading and writing activities.

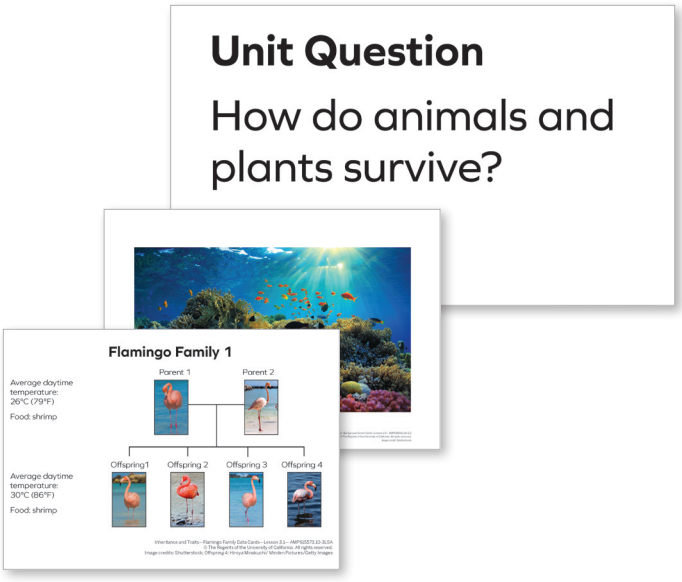
> One copy delivered in the unit kit, additional add-on copies available

Hands-on materials

Each unit kit contains consumable and nonconsumable materials for use during hands-on investigations.

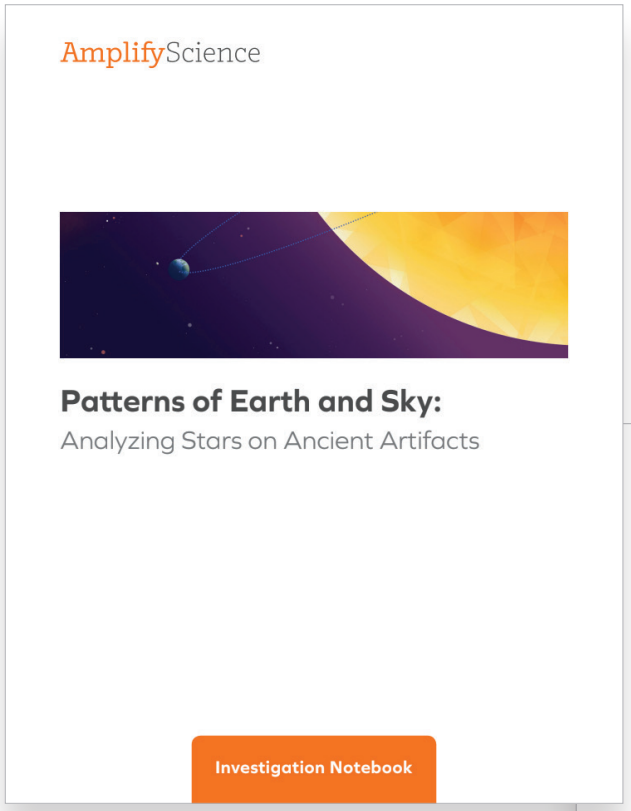
In the unit kit you will find:

- Hands-on materials
- 18 copies of each of the Student Books
- Big books (grades K–1)
- Classroom display materials
- One Student Investigation Notebook



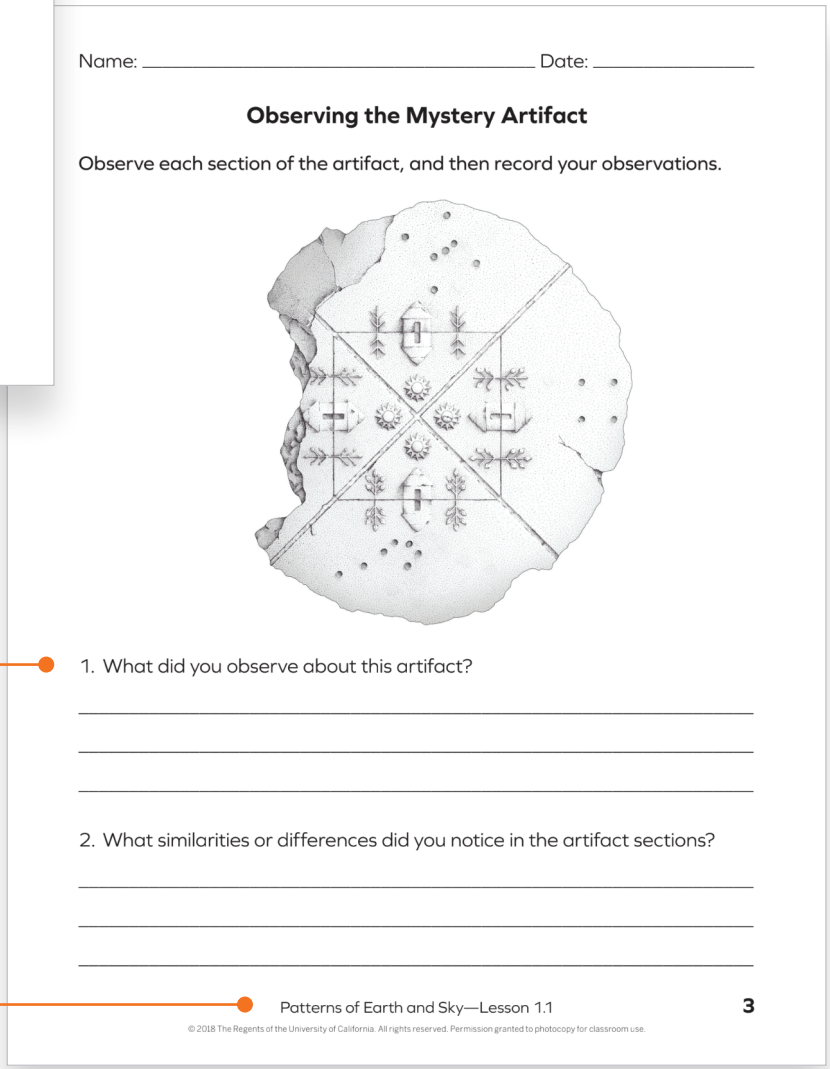
Classroom display materials

Student sample pages


AmplifyScience

Patterns of Earth and Sky:
Analyzing Stars on Ancient Artifacts

Investigation Notebook


Name: _____ Date: _____

Observing the Mystery Artifact

Observe each section of the artifact, and then record your observations.

1. What did you observe about this artifact?

_____

_____

_____

2. What similarities or differences did you notice in the artifact sections?

_____

_____

_____

Patterns of Earth and Sky—Lesson 1.1 3

Student Investigation Notebook

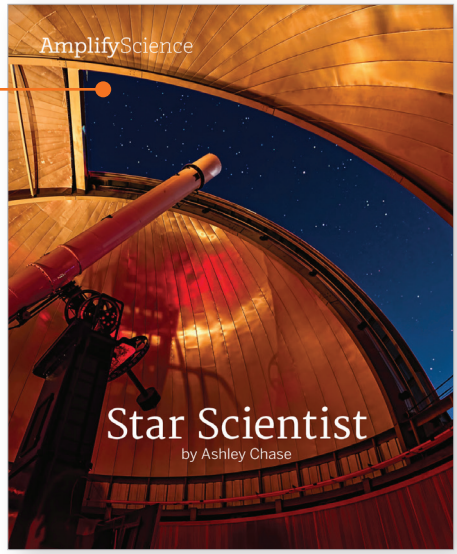
In the Student Investigation Notebook, students record observations and thinking throughout the unit. Notebooks contain scaffolding supports for reading and writing activities.

Student Investigation Notebooks are available for all units of Amplify Science Louisiana.

Student Books

Each unit of Amplify Science K–5 includes five unique and age-appropriate Student Books that allow students to:

- Engage with content-rich scientific text
- Obtain evidence
- Develop research skills
- Practice close reading



Integrated literacy and science instruction

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 kindergarten and grade 1.

Stars are not easy to investigate because they are so far away. The **sun** is close enough that we can see spots, flares, and other features. All the other stars, however, are much too far away to see clearly, even through the most powerful telescopes. Basri can't answer his questions about stars simply by looking at them. To answer his questions, Basri needs **data**: measurements and **observations** gathered in different ways.

From **Earth**, a star may look like just a pinpoint of light, but that light gives Basri the data he needs to figure out what the star is like. Based on the light coming from a star, Basri can tell how big the star is, what it is made of, how hot it is, how old it is, and more. He says, "Investigating stars is like detective work. You don't have the criminal in the room, but you have clues about what happened."

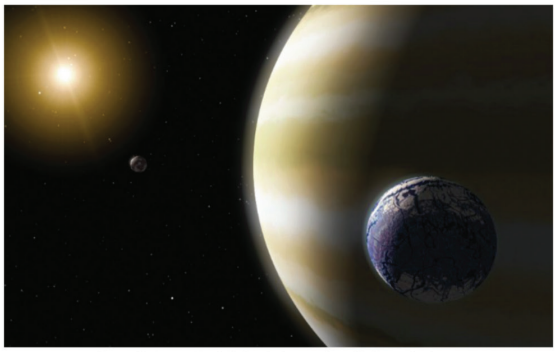
Gibor Basri is an astronomer.

4

One of the most interesting questions Basri has helped answer is: Do other stars besides the sun have planets **orbiting** them?

Many scientists worked together to investigate this question. Some of the scientists were experts on planets. Others were experts on light and telescopes. Basri and some other astronomers on the team were the experts on stars.

The question of whether planets orbit other stars was difficult to answer. The stars are extremely far away—we can only see them at all because they are so huge and bright. Planets are small and dim compared to stars, so it would be impossible to see a planet orbiting a distant star. This was a question that could only be answered by data—lots and lots of data.



An artist created this picture visualizing what the planets orbiting distant stars might look like.

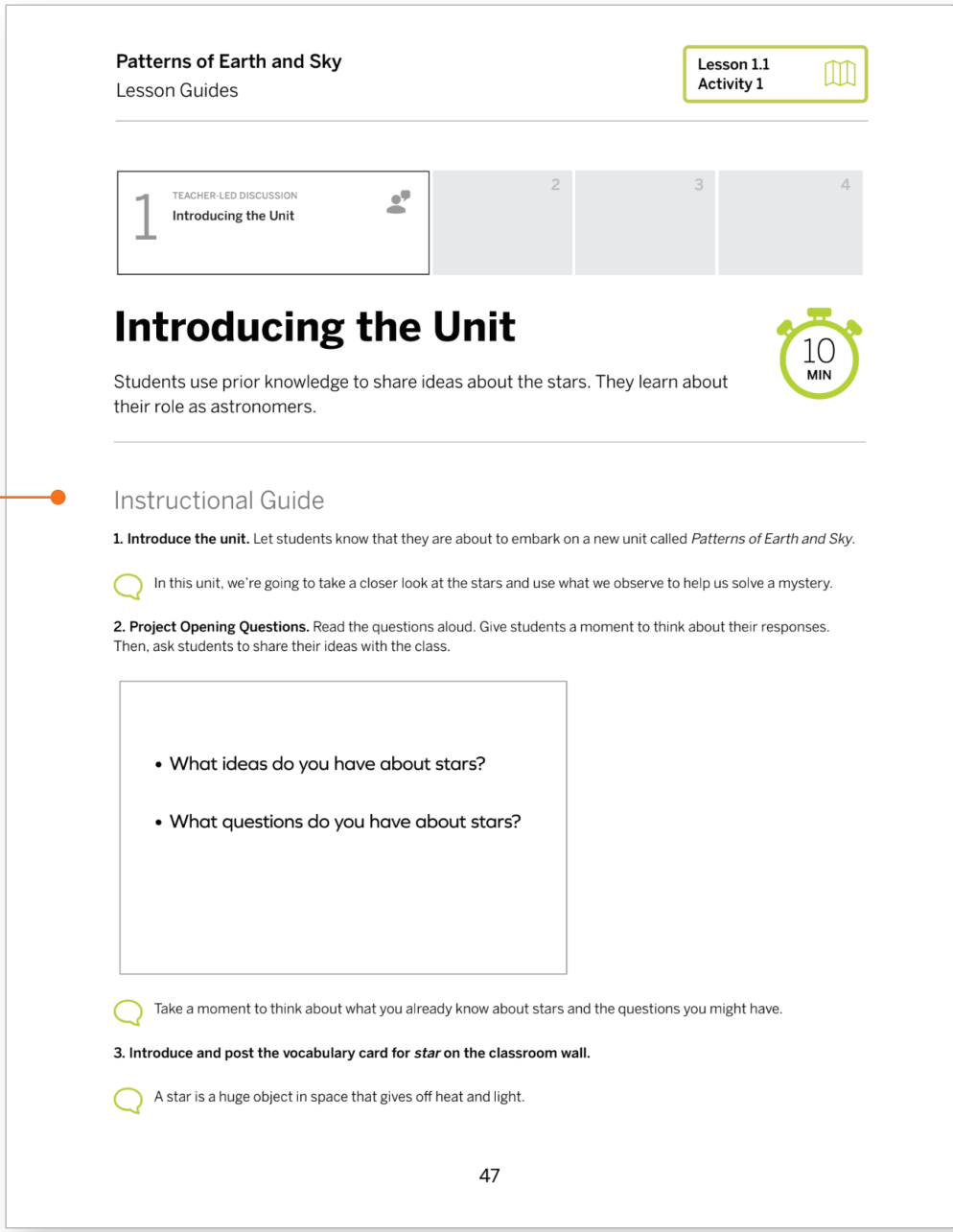
5

Teacher sample pages

Teacher's Guide

The Teacher's Guide contains step-by-step teaching instructions. Depending on the Activity, this section may also include:

- On-the-Fly Assessments, which offer guidance for using formative assessment opportunities.
- Teacher Supports, which note background information, pedagogical rationale, or instructional suggestions for the teacher.
- Possible Responses, which provide information about how to evaluate student work. These are found at the end of the Activity in a shaded box.



Patterns of Earth and Sky
Lesson Guides

Lesson 1.1
Activity 1

1 TEACHER-LED DISCUSSION
Introducing the Unit

2 3 4

Introducing the Unit

10 MIN

Students use prior knowledge to share ideas about the stars. They learn about their role as astronomers.

Instructional Guide

1. Introduce the unit. Let students know that they are about to embark on a new unit called *Patterns of Earth and Sky*.

In this unit, we're going to take a closer look at the stars and use what we observe to help us solve a mystery.

2. Project Opening Questions. Read the questions aloud. Give students a moment to think about their responses. Then, ask students to share their ideas with the class.

- What ideas do you have about stars?
- What questions do you have about stars?

Take a moment to think about what you already know about stars and the questions you might have.

3. Introduce and post the vocabulary card for *star* on the classroom wall.

A star is a huge object in space that gives off heat and light.

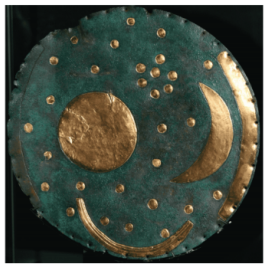
47

4. Project the following six images to introduce the unit. Pause after each and read the description, then call on students to share their thoughts about the images. As desired, share additional information from this instructional guide.

Sky Disc

- found near Nebra, Germany
- about 3,600 years old
- made of metal, about 30 cm across

Sky Disc
Nebra, Germany
3,600 years old



The printed Teacher's Guide tells teachers where online features will be used. Teachers can access online features, including digital simulations, science practice tools, and multimedia components, in the digital Teacher's Guide.

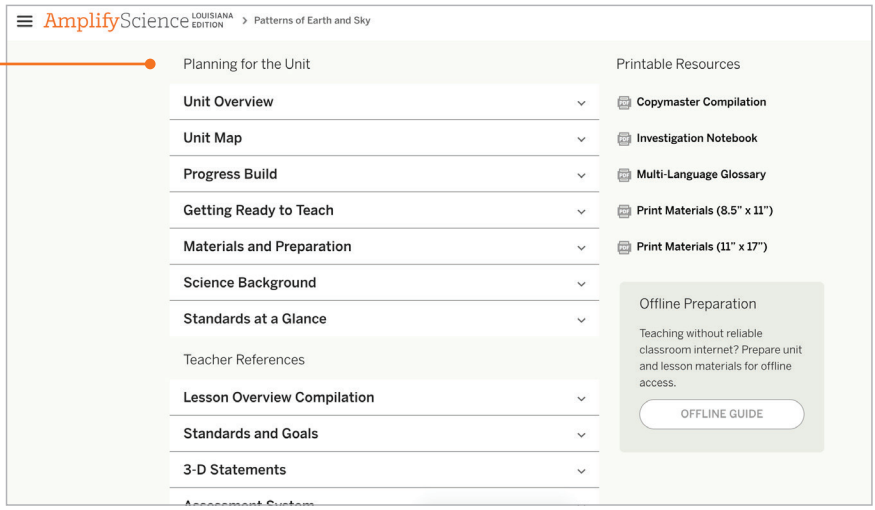
Teacher sample pages

Digital Teacher's Guide

The digital Teacher's Guide houses a year of interactive lessons, rich multimedia resources, and everything else you need for instruction.

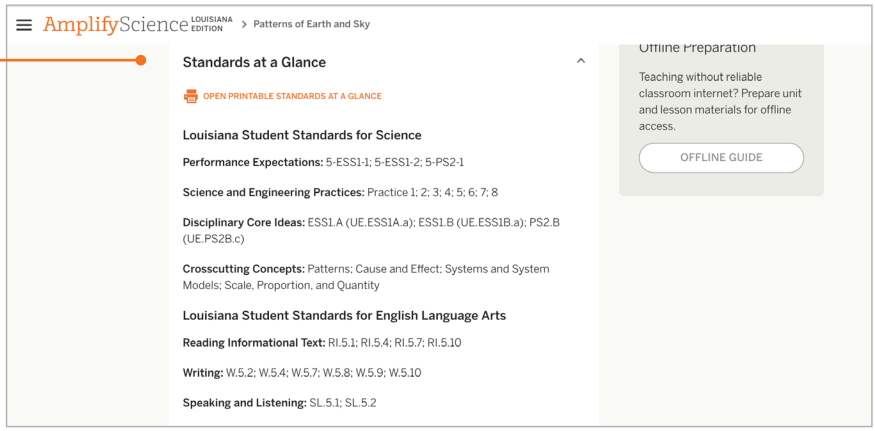
Planning for the Unit

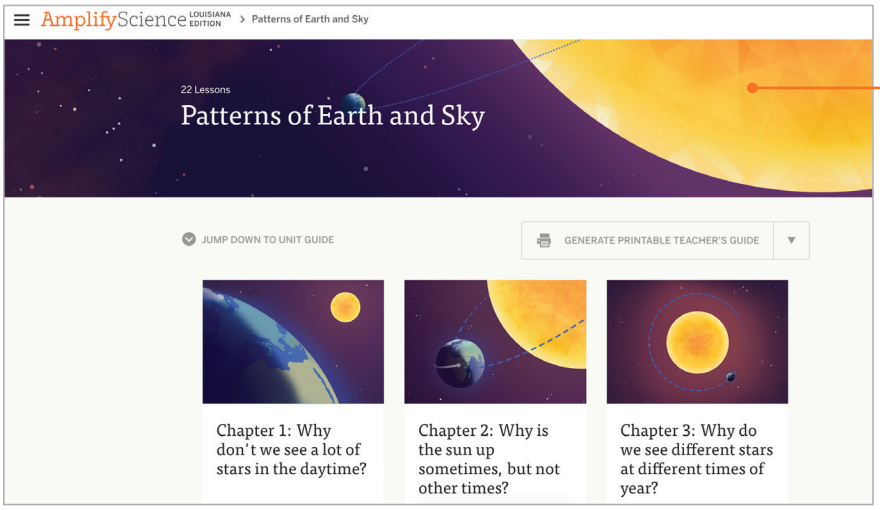
In the digital Teacher's Guide, teachers can access information to help prepare for instruction, including progress builds, a list of materials needed, science background information, and standards.



Standards at a Glance

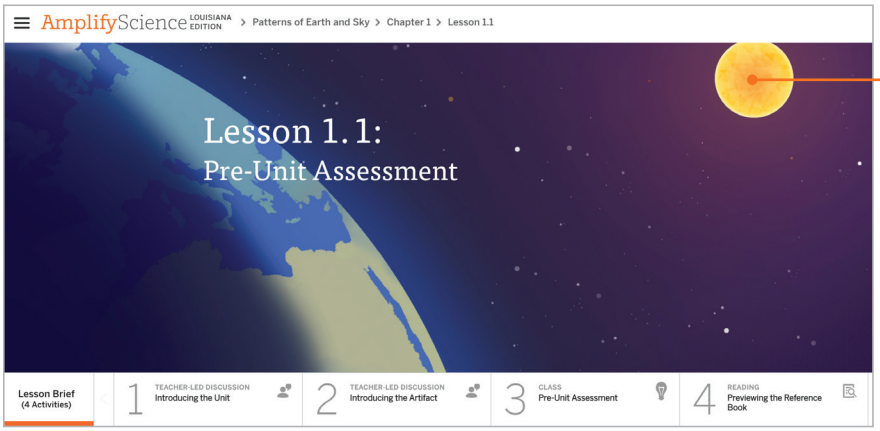
The Standards at a Glance section details the Louisiana Student Standards for Science covered in each unit.





Chapter selection

On the Unit Overview screen, you'll see each of the unit's chapters, where you'll click to begin instruction.



Lessons

Each unit is made up of a series of chapters, and each chapter contains a series of lessons. In each lesson, you'll find step-by-step teacher instructions and digital resources like projections and videos that you'll reference during the lesson.

Begin your review online at amplify.com/science/louisiana/review.

To learn more about Amplify Science Louisiana and to learn about professional learning opportunities in your area, visit **amplify.com/science/louisiana**

Amplify.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

AMP-SCI-LA-K5-0119