START HERE

Amplify Science

Grade 1

Instructional sampler

Amplify.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Amplify Science

Suggested review experience

Welcome to Amplify Science! In your program sample, you'll find resources and program materials to help you in your review. We recommend exploring the materials in the following order:

1. Instructional sampler

This is what you're holding in your hands right now. The instructional sampler gives you high-level insights into the program's development and approach, information about the various program materials, and a step-by-step walkthrough of how to dig into the online experience for a thorough review.

2. Student print materials

Review the student print materials included in your sample. In this box, you have all of the print student materials used over the course of the year, including Student Investigation Notebooks and Student Books.

3. Exemplar print Teacher's Guide

Review the Teacher's Guide included in the box. The print Teacher's Guide is a printed version of the digital Teacher's Guide and allows you to plan for and deliver most instruction in the program. You'll need to access certain materials for instruction (projections, videos, etc.) via the digital Teacher's Guide.

4. Digital Teacher's Guide

Explore the digital version of the Teacher's Guide, as well as other program features, by visiting amplify.com/sciencek5. A guided tour will familiarize you with navigating the program and its features.

amplify.com/sciencek5

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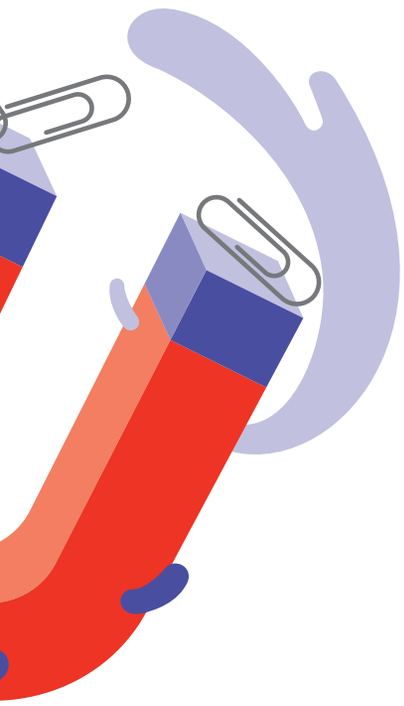



Gary's Sand Journal

About the program

About Amplify Science

In every unit of Amplify Science, students take on the roles of scientists and engineers to figure out real-world phenomena. Students actively investigate compelling questions by finding and evaluating evidence then developing convincing arguments.

In an Amplify Science classroom, students:

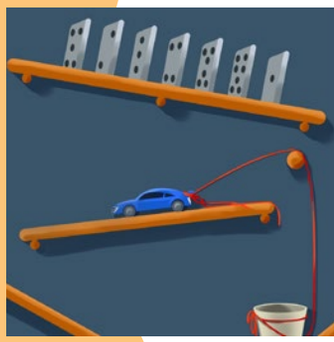
- ✔ **Collect evidence from a variety of sources.**
- ✔ **Make sense of evidence in a variety of ways.**
- ✔ **Formulate convincing scientific arguments.**

Built for new science standards and three-dimensional learning

The Next Generation Science Standards have raised the bar in science education. We set out to create a science program that educators can leverage to bring three-dimensional learning to life for their students. Educators who adopt Amplify Science have access to a comprehensive curriculum complete with detailed lesson plans, hands-on activities and materials, digital tools, embedded assessments, and robust teacher supports.

Amplify Science meets higher expectations for science teaching and learning:

- Anchor phenomena, explored through diverse interdisciplinary contexts, serve as the foundation for compelling, coherent storylines.
- Research-based multimodal learning allows students to develop expertise in all Science and Engineering Practices (SEPs) and deep understanding of Disciplinary Core Ideas (DCIs) and Crosscutting Concepts (CCCs) through experiences within a wide variety of contexts.
- Modeling tools enable students to create, and later revise, visualizations of their ideas of key scientific phenomena at critical points in the curriculum.
- Embedded engineering in 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 powerful partnership

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

UC Berkeley's Lawrence Hall of Science 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 continually enhanced and updated.

Amplify.

A pioneer in K–12 education since 2000, Amplify is leading the way in next-generation curriculum and assessment. Our captivating core and supplemental programs in ELA, math, and science engage all students in rigorous learning and inspire them to think deeply, creatively, and for themselves. Our formative assessment products turn data into practical instructional support to help all students build a strong foundation in early reading and math. All of our programs provide teachers with powerful tools that help them understand and respond to the needs of every student. Today, Amplify serves five million students in all 50 states.

Hear from our program authors

For 15 years, I've been fortunate to lead an outstanding team of scientists and educators as director of the Learning Design Group at UC Berkeley's Lawrence Hall of Science. We are extremely proud of Amplify Science and appreciate your taking the time to review the program. We developed Amplify Science to reflect the latest thinking and research about science teaching and learning. Along the way, we undertook extensive field testing to ensure our new program works well in real classrooms, with real students and teachers.

I think you'll find that Amplify Science stands apart from other middle school science programs in the following ways: a research-based, multimodal pedagogical approach where students learn to think like scientists and engineers by investigating real-world problems; a balanced blend of hands-on, digital, and literacy activities that are highly engaging and effective; embedded assessments that support differentiation for diverse learners; and robust teacher support for successful implementation. I hope you enjoy exploring the curriculum as much as we enjoyed creating it.

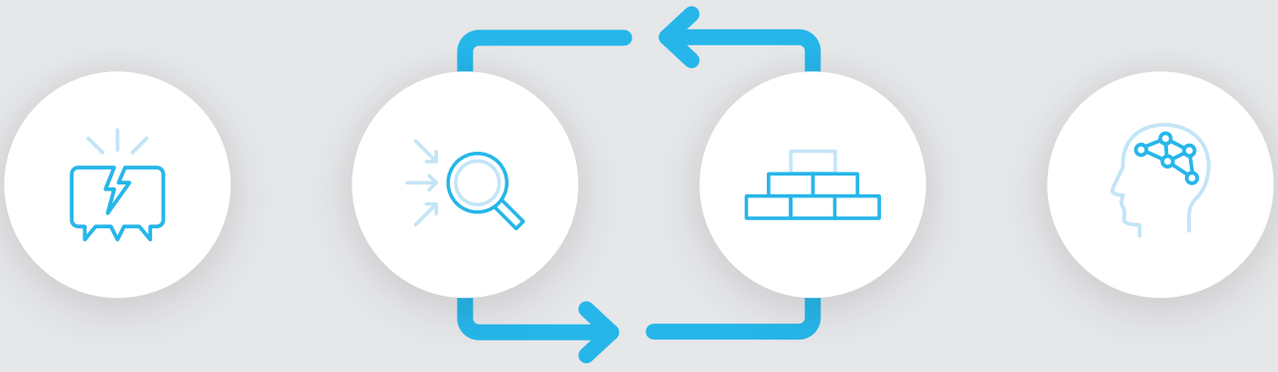
Sincerely,

Jacqueline Barber
Director, Learning Design Group,
Lawrence Hall of Science

A unique, phenomena-based approach

In each Amplify Science unit, students 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. Each unit also provides students with opportunities to apply what they have learned to solve new problems in different contexts. This enables students to demonstrate a deep understanding of phenomena and practices.



Engage students with a real-world problem

Explore evidence from multiple sources

Construct increasingly complex explanations

Apply knowledge to solve a different problem

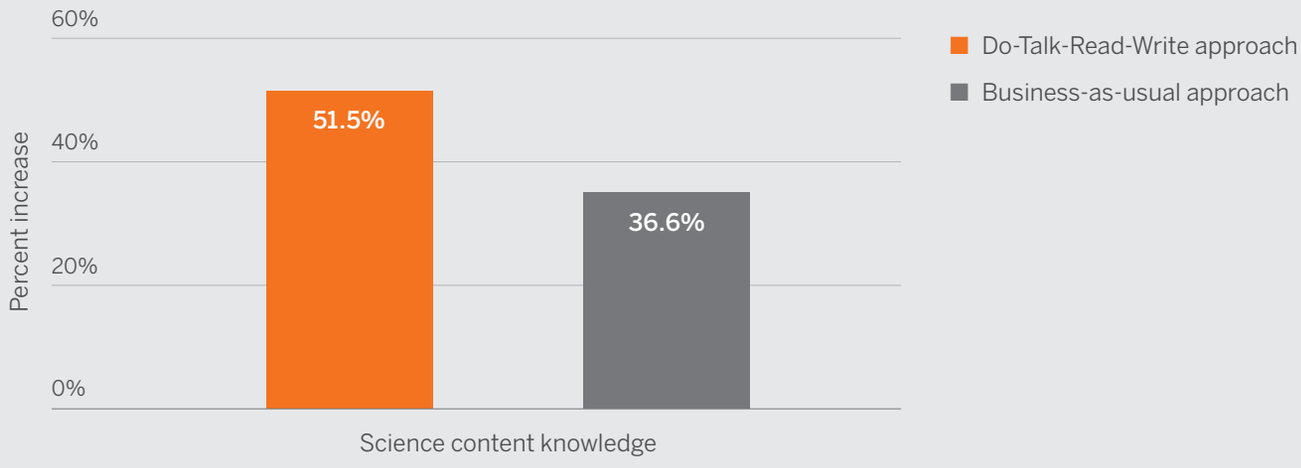
Grounded in research and proven effective

UC Berkeley's Lawrence Hall of Science, the authors behind Amplify Science, developed the Do, Talk, Read, Write, Visualize approach, and gold-standard research shows that it works. Our own efficacy research is pretty exciting, too.

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 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.



Source: Cervetti, Barber, Dorph, Pearson, & Goldschmidt, 2012; Duesbury, Werblow, & Twyman, 2011; Wang & Herman, 2005

Program structure

Units per year

Grades K–2: **3**

Grades 3–5: **4**

Unit types

Although every Amplify Science unit provides a three-dimensional learning experience, each unit contains multiple science and engineering practices, but has one of the following specific practices as its focus.

Investigation

Investigation units focus on the process of strategically developing investigations and gathering data to answer questions. Students are first asked to consider questions about what happens in the natural world and why, and are then involved in designing and conducting investigations that produce data to help answer those questions.

Modeling

These Amplify Science units emphasize opportunities for students to engage in the practice of modeling. Students use physical models, investigate with computer models, and create their own diagrams to help them visualize what might be happening on the nanoscale.

Course structure

Each unit includes two dedicated assessment days.

Key: (A) Argumentation (E) Engineering Design (I) Investigation (M) Modeling

Kindergarten

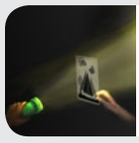
Needs of Plants and Animals
22 lessons (I)

Pushes and Pulls
22 lessons (E)

Sunlight and Weather
22 lessons (M)

Grade 1

Animal and Plant Defenses
22 lessons (M)



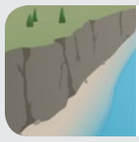
Light and Sound
22 lessons (E)

Spinning Earth
22 lessons (I)

Grade 2

Plant and Animal Relationships
22 lessons (I)

Properties of Materials
22 lessons (E)



Changing Landforms
22 lessons (M)

Engineering design

Engineering design solves complex problems by applying science principles to the design of functional solutions, and iteratively testing those solutions to determine how well they meet pre-set criteria. All Amplify Science engineering design units are structured to make the development of such solutions the central focus.

Argumentation (grades 3–5)

These Amplify Science units emphasize opportunities for students to engage in the practice of argumentation. As students move up the K–5 grades, they focus on important aspects of argumentation in an intentional sequence.

Grade 3

Balancing Forces

22 lessons

M

Inheritance and Traits

22 lessons

I

Environments and Survival

22 lessons

E

Weather and Climate

22 lessons

A

Grade 4

Energy Conversions

22 lessons

E

Vision and Light

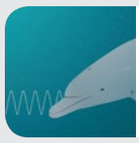
22 lessons

I

Earth's Features

22 lessons

A



Waves, Energy, and Information

22 lessons

M

Grade 5

Patterns of Earth and Sky

22 lessons

I

Modeling Matter

22 lessons

M

The Earth System

26 lessons

E

Ecosystem Restoration

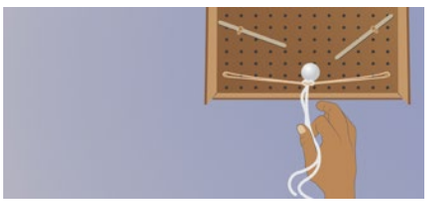
22 lessons

A

Phenomena and student roles in grades K–5

In every Amplify Science unit, students take on the role of scientists or engineers—marine biologists, geologists, water resource engineers, and more—to solve a real-world problem. These engaging roles and phenomena bring science to life in your classroom.

Examples



KINDERGARTEN

Pushes and Pulls

How can we create a pinball machine for our class?

Anchor phenomenon: Pinball machines allow people to control the direction and strength of forces on a ball.

Students take on the role of pinball machine engineers as they investigate the effects of forces on the motion of an object. They conduct tests in their own prototypes (models) of a pinball machine and use what they learn to contribute to the design of a class pinball machine. Over the course of the unit, students construct a foundational understanding of why things move in different ways.

GRADE 1

Animal and Plant Defenses

How can a sea turtle survive in the ocean after an aquarium releases it?

Anchor phenomenon: Spruce the Sea Turtle lives in an aquarium and will soon be released back into the ocean, where she will survive despite ocean predators.

Students play the role of marine scientists. In their role, students apply their understanding of plant and animal defense structures to explain to aquarium visitors how a sea turtle and her offspring can defend themselves from ocean predators when they are released into the wild.

GRADE 2

Changing Landforms

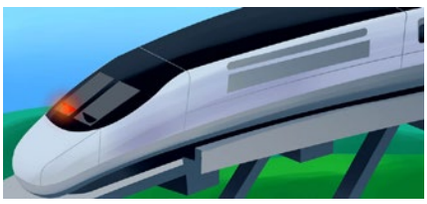
Why is the edge of the ocean cliff closer to the flagpole than it used to be?

Anchor phenomenon: The cliff that Oceanside Recreation Center is situated on appears to be receding over time.

The director of the Oceanside Recreation Center gets a scare when a nearby cliff collapses overnight. Research reveals that the distance between the recreation center's flagpole and the edge of the cliff has changed over time. **Students play the role of geologists and work to figure out why the cliff has changed over time.** Based on what they learn about erosion, they advise on whether it is safe to keep the center open even though the cliff is changing.

GO ONLINE

To read about the anchor phenomena and student roles for every Amplify Science unit, visit amplify.com/sciencek5.



GRADE 3

Balancing Forces

How is it possible for a train to float?

Anchor phenomenon: The town of Faraday is getting a new train that floats above its tracks.

People in Faraday are excited to hear that a new train service will be built for their city, but concerned when they hear that it will be a floating train. **Students take on the role of scientists in Faraday to figure out how a floating train works in order to explain it to the city's residents.** They develop models of how the train rises, floats, and then falls back to the track, and then write an explanation of how the train works.

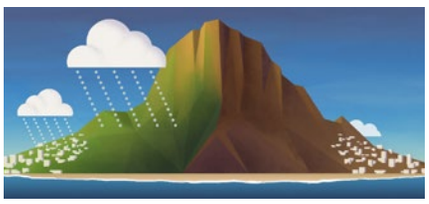
GRADE 4

Vision and Light

Why is an increase in light affecting the health of Tokay geckos in a Philippine rainforest?

Anchor phenomenon: The population of Tokay geckos in a rainforest in the Philippines has decreased since the installation of new highway lights.

As conservation biologists, students work to figure out why a population of Tokay geckos has decreased since the installation of new highway lights in the rainforest. Students use their understanding of vision, light, and information processing to figure out why an increase in light in the geckos' habitat is affecting the population.



GRADE 5

The Earth System

Why is East Ferris experiencing a water shortage and what can the city do about it?

Anchor phenomenon: East Ferris, a city on one side of the fictional Ferris Island, is experiencing a water shortage, while West Ferris is not.

The cities of East Ferris and West Ferris are located on different sides of a mountain on the fictional Ferris Island. East Ferris is having a water shortage while West Ferris is not. **As water resource engineers, students learn about the Earth system to help figure out what is causing the water shortage problem and design possible solutions, including freshwater collection systems and proposals for using chemical reactions to treat wastewater.**

Approach to assessment

The Amplify Science assessment system is grounded in the principle that students benefit from regular and varied opportunities to demonstrate understanding through performance.

Each unit includes a range of formative assessments embedded in instruction with the goal of providing regular, actionable information to the teacher with minimal impact on instructional time.

The variety of assessment options for Amplify Science K–5 include:

F **Formative** S **Summative**

Formative

Pre-Unit Assessment

These assessments make use of discussion, modeling, and written explanations to gauge student knowledge prior to starting a unit.

Formative

On-the-Fly Assessments (OtFAs)

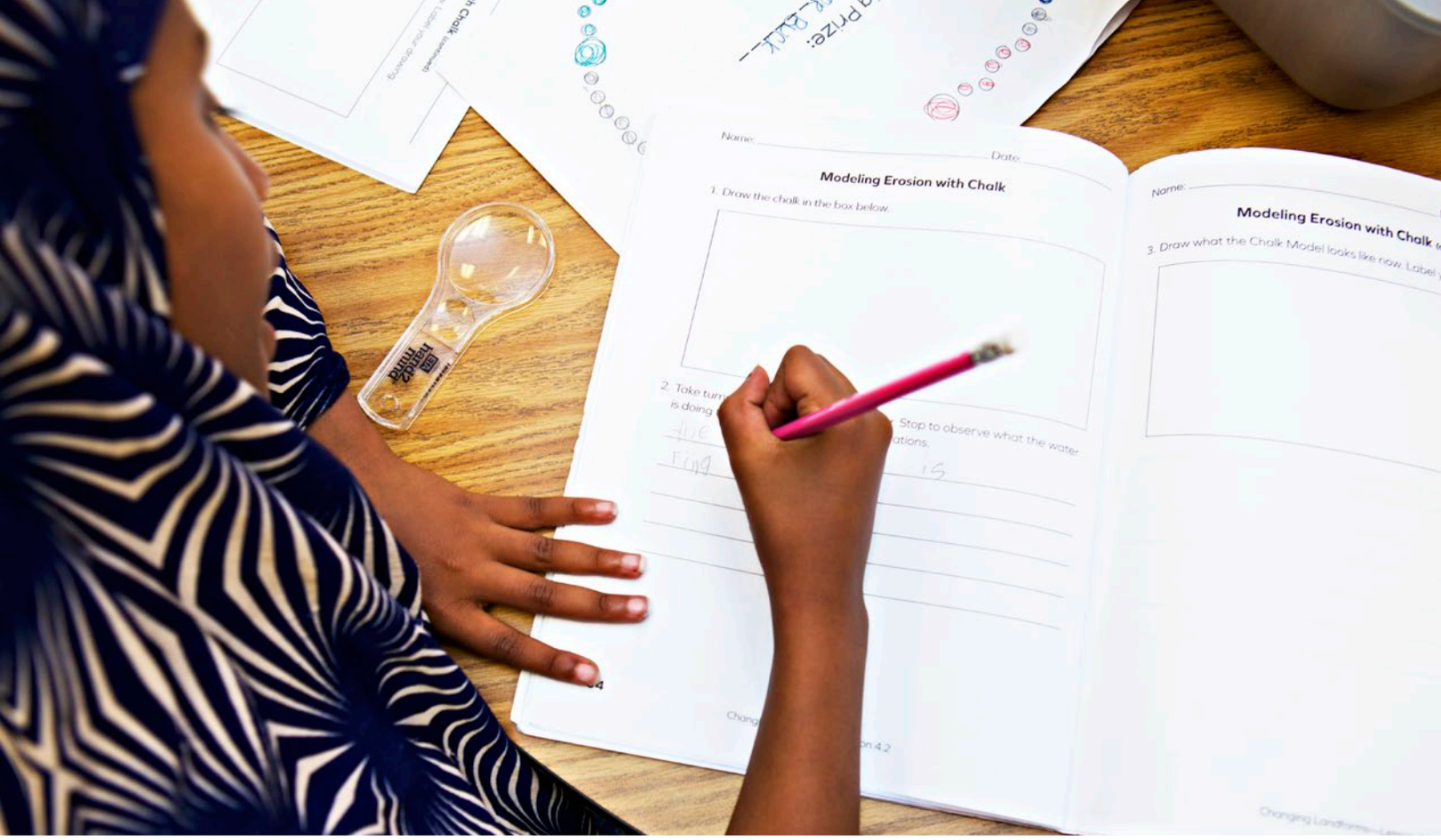
Multidimensional assessments integrated regularly throughout the lessons. OtFA opportunities were designed to help a teacher make sense of student activity during a learning experience and to provide evidence of how a student is coming to understand core concepts and developing dexterity with SEPs and CCCs.

Self-Assessments

Once per chapter, students are given a brief opportunity to reflect on their own learning, ask questions, and reveal ongoing wonderings about unit content. Students respond to a consistent set of prompts each time, ensuring that their own progress is visible to them.

Critical Juncture Assessments

Each chapter includes an integrated multidimensional performance task that supports students' consolidation of the ideas encountered in the chapter and provides insight into students' developing understanding. Examples include writing scientific explanations, engaging in argumentation, developing and using models, and designing engineering solutions.



Summative

End-of-Unit Assessment

Assessments toward the end of each unit feature a combination of targeted discussions, student-generated models, and written explanations or arguments to enable students to demonstrate understanding and growth at the conclusion of a unit.

NGSS BENCHMARK ASSESSMENTS

Developed by Amplify, the Next Generation Science Standards (NGSS) Benchmark Assessments give you insight into how your students are progressing toward mastery of the three dimensions and performance expectations of the NGSS ahead of high-stakes end-of-year assessments. They are given 3–4 times per year, depending on the grade level, and are delivered after specific units in the recommended Amplify Science scope and sequence.


KINDNESS
Gates 2nd Grade
CB Cart
#17

Engaging materials

Hands-on investigations in grades K–5

Hands-on learning is an essential part of Amplify Science, and is integrated into every unit. Students actively participate in science, playing the roles of scientists and engineers as they gather evidence, think critically, solve problems, and develop and defend claims about the world around them. Every unit includes hands-on investigations that are critical to achieving the unit's learning goals.

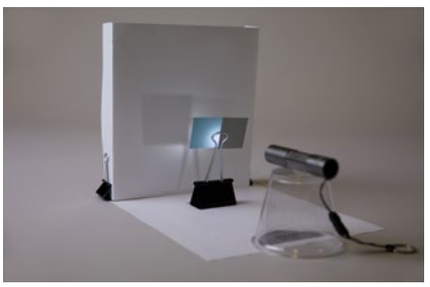
Examples

KINDERGARTEN

Pushes and Pulls

Showcasing the Box Models (Lesson 5.3)

In Lesson 5.2 of Pushes and Pulls, students synthesize what they have figured out about force and motion to create a culminating design for their pinball machine models. Students incorporate a launcher, flippers, and bumpers into their model to help their pinball reach a target. Students then test their models to observe whether or not their solutions work as expected, and then make any additional modifications as necessary.

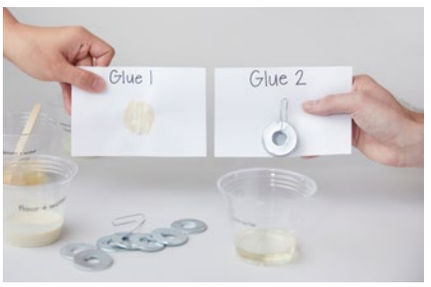


GRADE 1

Light and Sound

Investigating Materials That Do Not Block (Lesson 3.1)

By Lesson 3.1 of Light and Sound, students have figured out that not all materials block light to create a dark area on a surface. Partners use their Investigation Kits to test non-blocking materials (clear plastic, tinted plastic, and wax paper) in comparison to cardboard, a known blocking material. Students use their observations of these materials comparisons to discuss what may cause variation in the brightness of the areas created on a surface.



GRADE 2

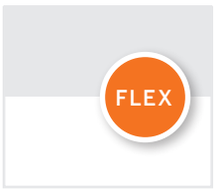
Properties of Materials

Making Our Second Glue and Setting Up Tests (Lesson 3.5)

In Lesson 3.5 of Properties of Materials, students apply the evidence that they have collected about the properties of glue ingredients to create a recipe for a glue that meets a series of design goals. Students use available ingredients to create their unique glue and then set up a fair test with partners that will allow them to compare the properties of their glues.

GO ONLINE

For a complete materials list and to see more example activities, visit amplify.com/sciencek5.



Hands-on Flextensions

Hands-on Flextensions are additional, optional investigations that are included at logical points in the learning progression and give students an opportunity to dig deeper if time permits. These activities offer teachers flexibility to choose to dedicate more time to hands-on learning.

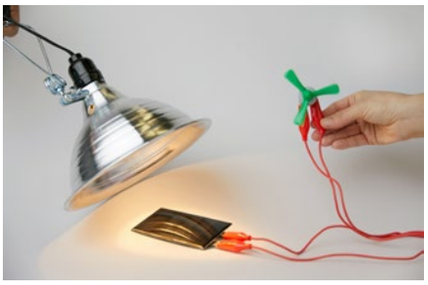
Materials referenced in Hands-on Flextension activities will either be included in the unit kit or are easily sourced. Supporting resources such as student worksheets will be included as downloadable PDF files.

GRADE 3

Inheritance and Traits

Exploring Inheritance (Lesson 2.4)

In Lesson 2.4 of Inheritance and Traits, students investigate how traits are passed down from parents to offspring by building clay creature offspring. Students work in pairs to make clay creature offspring with specific traits based on instructions that were randomly inherited from two parent creatures. In the discussion following the activity, students compare creatures and observe that, although the offspring inherited instructions from the same parents, there is variation in traits among siblings.



GRADE 4

Energy Conversions

Designing Wind Turbines (Lesson 3.4)

In Lesson 3.4 students are introduced to their first hands-on design challenge: to design and build a wind turbine. Students receive two proposed solutions to the blackout problem in Ergstown, both of which are intended to bring more energy to the electrical system: installing solar panels or installing wind turbines. In order to make an informed choice between the two proposed solutions, students are given a design challenge: to build a wind turbine that meets certain design criteria. Students then engage in the design cycle as they explore the available materials and plan, make, and test their wind turbine designs.

GRADE 5

The Earth System

Observing Substances and Mixing Substances (Lesson 5.1)

In Lesson 5.1 of The Earth System, students investigate how new substances form. Students observe a chemical reaction by mixing calcium chloride, baking soda, and phenol red solution. They discuss and record their observations of the substances before, during, and after the reaction.

GO ONLINE

Preview all Student Books in grades K–5 at amplify.com/sciencek5.

Student Books

About the books

Each unit of Amplify Science K–5 includes five unique Student Books written by the Lawrence Hall of Science specifically for the program. 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 unit.

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, provide real world connections as they master reading-to-learn and close reading skills, and construct evidence-based arguments.

Instructional approach

Beginning and young readers have unique developmental needs, and science instruction should support these students in reading more independently as they progress through sections of content, the school year, and each grade.

One way Amplify Science meets these needs is by strategically deploying different modes of reading throughout each unit: Read-Aloud, Shared Reading, and Partner Reading.

Read-Aloud

In the Read-Aloud mode, the teacher reads the book while students listen. During a Read-Aloud, the teacher models fluent and expressive reading, demonstrates strategic reading, thinks aloud about the content of the book, introduces new vocabulary, and facilitates students' comprehension as the class gathers information to figure out a science idea. In grades K–1, all Student Books are also included as Big Books for read-alouds.

Shared Reading

In the Shared Reading mode, the teacher and students interact with the book together. Shared Reading provides additional opportunities for students to observe the teacher as an expert reader, to actively join in the discussion about the book, and to practice using a focal comprehension strategy.

Partner Reading

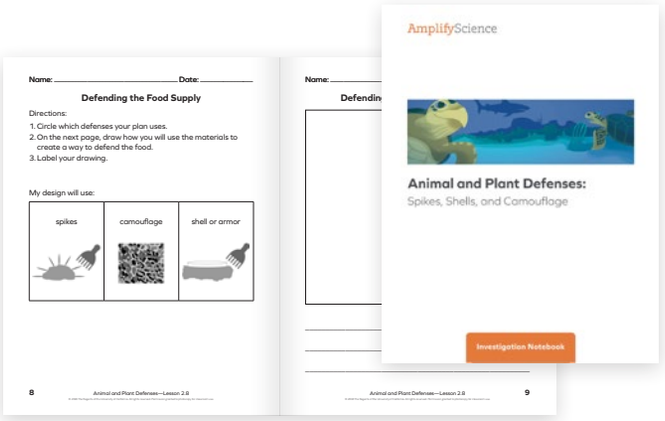
In Partner Reading mode, two students work together to read or gather information from a book. Partner Reading provides opportunities for each student in a pair to be the reader and the supporter while reading a text.

SPANISH LANGUAGE SUPPORT

All Student Books are also available in Spanish.

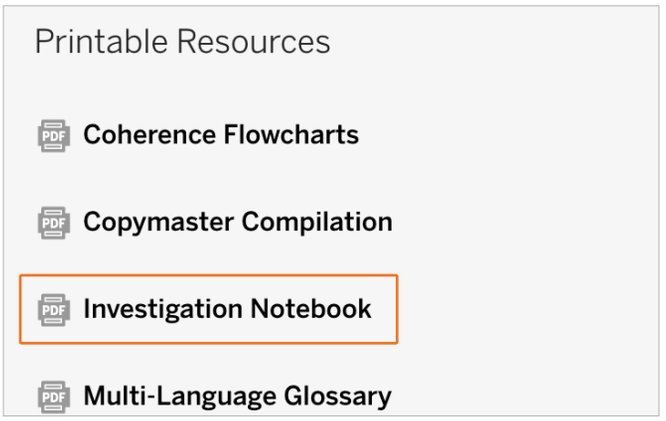
Student Investigation Notebooks

Every unit in Amplify Science has a Student Investigation Notebook, where students record data and observations, make drawings, and complete writing tasks. Scaffolding supports for reading and writing activities are also included in each notebook.



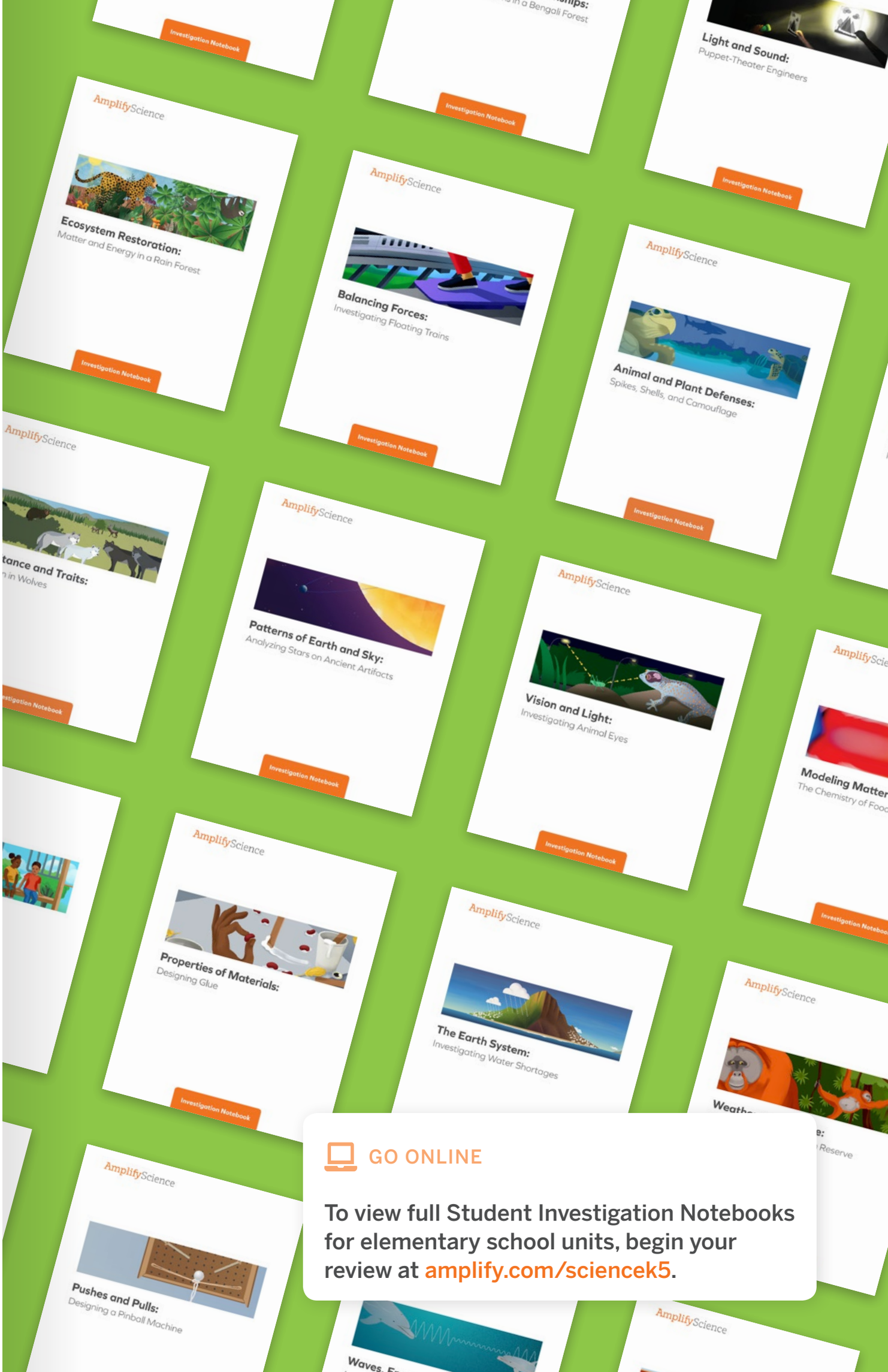
In grades K–5, one copy of the Student Investigation Notebook is included in each unit's materials kit for use as a blackline master.

The Student Investigation Notebook for each unit is also available as a downloadable PDF on the Unit Guide page of the digital Teacher's Guide.



SPANISH LANGUAGE SUPPORT

All Student Investigation Notebooks are also available in Spanish.



GO ONLINE

To view full Student Investigation Notebooks for elementary school units, begin your review at amplify.com/sciencek5.

Digital resources

Students have access to a variety of digital tools to enrich their learning throughout the Amplify Science K–5 program.

Grades K–1

In kindergarten and grade 1, students observe various types of media (videos, images, etc.) through teacher projections. In these grade levels, however, students are not expected to access their own digital experiences.

Grades 2–3

In grades 2 and 3, some student-facing technology is available, with four to five lessons per unit that have activities where students can use science practice tools to to aid in the modeling, graphing, and sorting of information related to the unit's central problem. (A unit has 22 lessons total.)

Grades 4–5

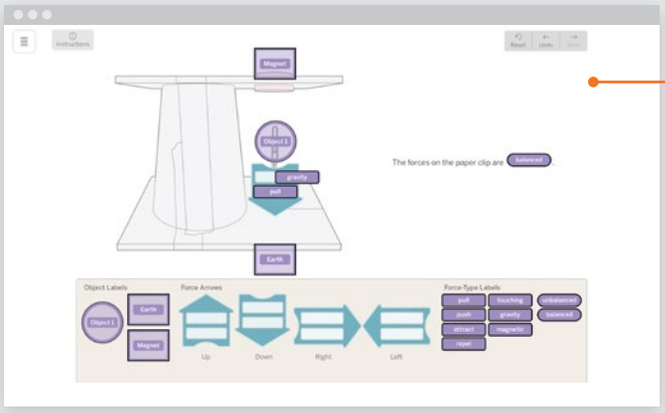
Students in grades 4 and 5 use digital tools and simulations more frequently, with 30-40 percent of lessons including opportunities to use a digital tool.

Videos

Videos are incorporated into Amplify Science units across grades K–5. Whenever a video is present, the teacher projects the video to the students from their own device. Students are never prompted to access videos themselves in Amplify Science grades K–5. If a teacher does not have internet access in the classroom, they can download videos before class.

Practice Tools

A collection of unit-specific digital apps, Practice Tools include simple drag-and-drop activities or easy-to-use data-entry tools to aid students with sorting, modeling, or visualizing information. Practice Tools are included in each unit in grades 2–5, appearing in approximately three to five lessons per unit.



Modeling Tool

Data Tool

Teacher's Guides

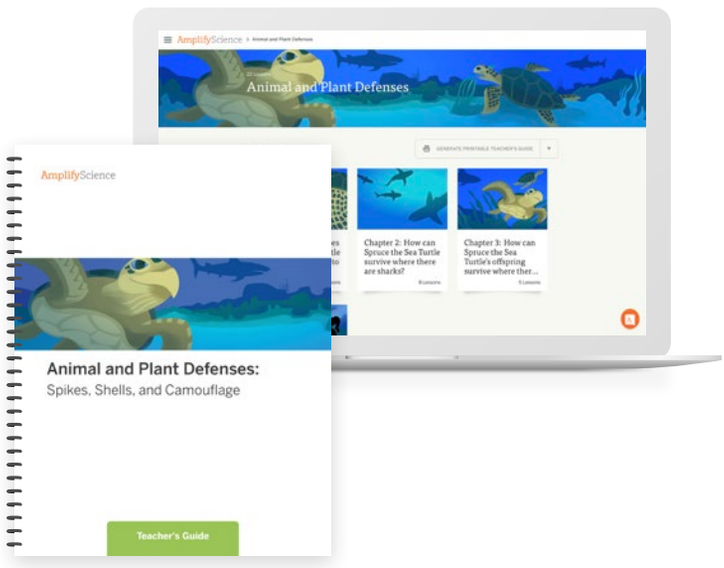
Every unit of Amplify Science includes a comprehensive Teacher's Guide containing lesson plans, differentiation strategies, and other instructional supports and resources at the unit, lesson, and individual activity levels.

Plan for instruction

Teachers can access their lesson plans through the print or digital Teacher's Guides. Both formats include the same unit-level overview and preparation information, as well as step-by-step instructions for every activity in every lesson.

The Teacher's Guide contains step-by-step teaching instructions, which include:

- 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.
- On-the-Fly Assessments, which offer guidance for using formative assessment opportunities.



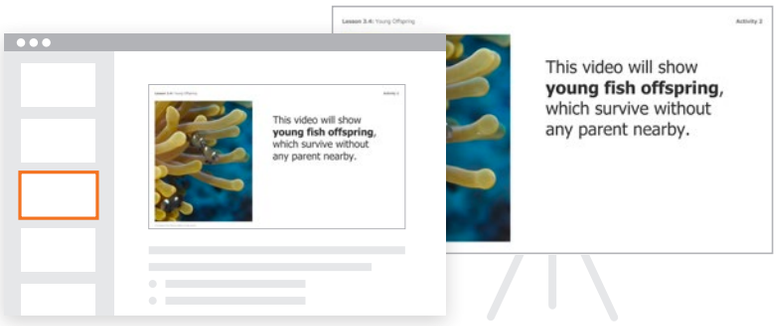
SPANISH LANGUAGE SUPPORT

A Spanish add-on license gives teachers access to lesson projections, PDFs of print materials, and recommended in-class "teacher talk" moments in Spanish.

GO ONLINE

Log into the digital Teacher's Guide and explore digital tools in Amplify Science at amplify.com/sciencek5.

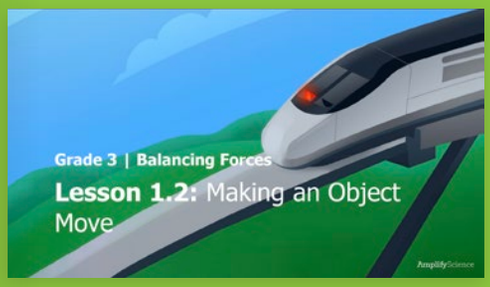
Deliver instruction

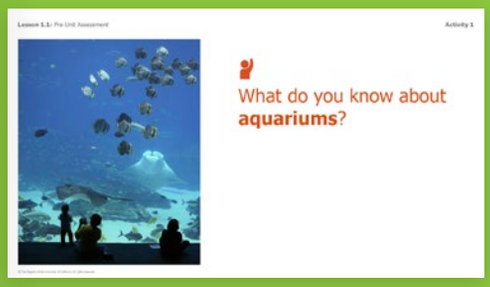


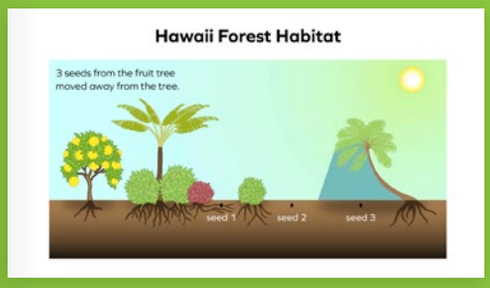
Classroom Slides

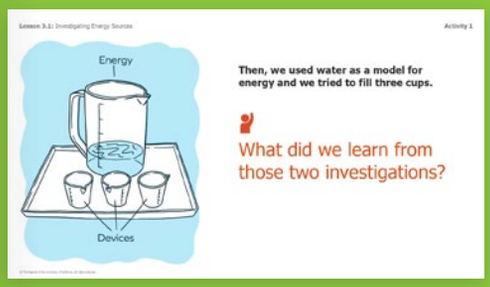
To make planning and delivering instruction faster and easier, Amplify has developed Classroom Slides for all K–5 lessons. Each lesson comes with a downloadable and editable PowerPoint file to help guide teachers and their students through the lesson with clearly-sequenced, engaging, and easy-to-follow images, videos, questions, and instructions.

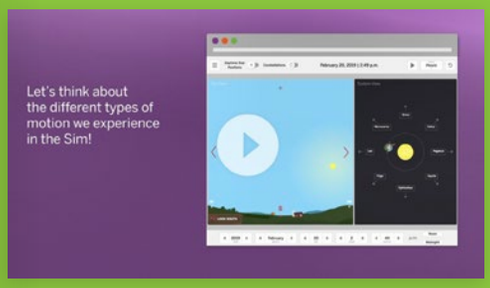
Classroom Slides allow teachers to easily customize their lessons and streamline the in-class presentation experience. Slides take key lesson content—including student-facing questions, teacher prompts, activity transitions, and visuals—and put it in a logical sequence. At any time, teachers can feel free to change the wording, paste in a new visual, or link to their favorite YouTube video.

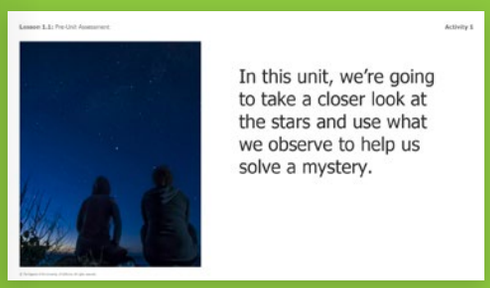


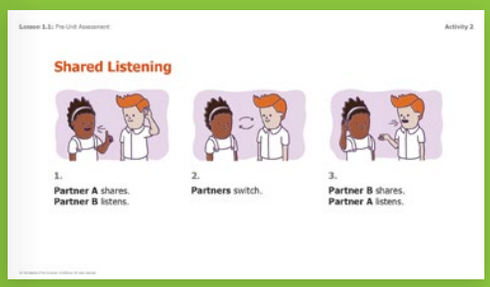












In your classroom

Grade 1: Year at a glance

Grade 1 in Amplify Science contains three units, each containing 22 total lessons: 20 45-minute lessons and two dedicated assessment days.

20 45-minute lessons
2 dedicated assessment days
Modeling focus

In the *Animal and Plant Defenses: Spikes, Shells, and Camouflage* unit, students learn how structures help organisms and their offspring meet survival needs. This knowledge serves as a foundation for future learning about adaptations, inheritance, genetics, natural selection, and evolution.

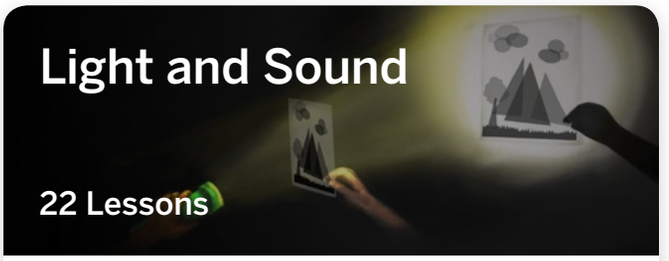
Student role and phenomena

Students take on the role of scientists advising an aquarium director on how to answer young visitors' questions about how Spruce the Sea Turtle will survive when released back into the ocean.

Insights

Students gather evidence through careful observations of photographs and videos of real organisms and by reading science texts. Students also use hands-on materials to create multiple models throughout the unit to explain their ideas about how defenses function.

Focal NGSS Performance Expectations:
1-LS1-1 • 1-LS1-2 • 1-LS3-1



20 45-minute lessons
2 dedicated assessment days
Engineering design focus

In the *Light and Sound: Puppet-Theater Engineers* unit, students tackle the question *How do we make different parts of a surface brighter or darker?* by investigating cause-and-effect relationships.

Student role and phenomena

In this unit, students take on the role of light and sound engineers as they are challenged to design, build, and project a scene for a puppet show.

Insights

Students apply knowledge to create a background scene for a puppet theater, using patterns of light to create the effects they want. They then create sound sources for their puppet show scene. By the end of the unit, students will have engaged in several engineering design cycles in which they learn, plan, make, and test different solutions to a problem.

Focal NGSS Performance Expectations:
1-PS4-1 • 1-PS4-2 • 1-PS4-3 • 1-PS4-4
K-2-ETS1-1 • K-2-ETS1-2 • K-2-ETS1-3

20 45-minute lessons
2 dedicated assessment days
Investigation focus

In the *Spinning Earth: Investigating Patterns in the Sky* unit, students explore what the sky looks like during the daytime and the nighttime. They examine Earth as a round, ball-shaped planet and develop an understanding of the orientation of Earth and the sun in space, allowing them to figure out that daytime and nighttime are the result of Earth facing or not facing the sun.

Student role and phenomena
Students assume the role of sky scientists helping a young boy named Sai, who lives nearby, understand why the sky looks different to him that it does to his grandmother when they talk on the phone.

Insights
Students explore what they see in the sky at sunset, closely examining the change from daytime to nighttime. They gather data that shows that these patterns repeat from one day to the next in an ongoing cycle. By explaining these patterns, students develop an understanding that Earth is always spinning.

Focal NGSS Performance Expectations:
1-ESS1-1 • 1-ESS1-2 • 1-PS4-2

Deep dive: Animal and Plant Defenses

Take a closer look at the lessons and activities in the "Animal and Plant Defenses" unit.

CHAPTER 1 – DAY 1

Lesson 1.1
Pre-Unit Assessment

DAY 2

Lesson 1.2
Tortoise Parts

DAY 3

Lesson 1.3
Animal and Plant Structures

CHAPTER 2 – DAY 6

Lesson 2.1
Whose Lunch Is This?

DAY 7

Lesson 2.2
Sharp Structures for Eating

DAY 8

Lesson 2.3
Introducing Modeling

DAY 11

Lesson 2.6
Modeling Camouflage

DAY 12

Lesson 2.7
Explaining Defenses

DAY 13

Lesson 2.8
Defending the Food Supply

DAY 16

Lesson 3.3
Offspring Defenses

DAY 17

Lesson 3.4
Young Offspring

DAY 18

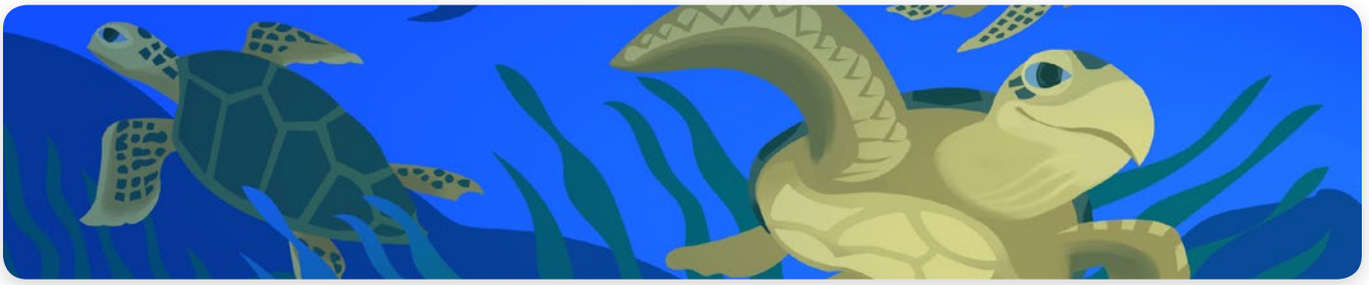
Lesson 3.5
Exploring Parental Care

DAY 21

Lesson 4.3
Aquarium Animal Exhibit

DAY 22

Lesson 4.4
End-of-Unit Assessment



DAY 4

Lesson 1.4
Surviving by Not Being Eaten

DAY 5

Lesson 1.5
Explaining Sea Turtle Survival

DAY 9

Lesson 2.4
Modeling Shells and Armor

DAY 10

Lesson 2.5
Modeling Spikes

CHAPTER 3 – DAY 14

Lesson 3.1
Introducing Offspring

DAY 15

Lesson 3.2
Parents and Offspring

CHAPTER 4 – DAY 19

Lesson 4.1
Frog Models

DAY 20

Lesson 4.2
Making Models for the Exhibit

Lesson includes a reading activity with Student Books

Lesson includes a hands-on investigation

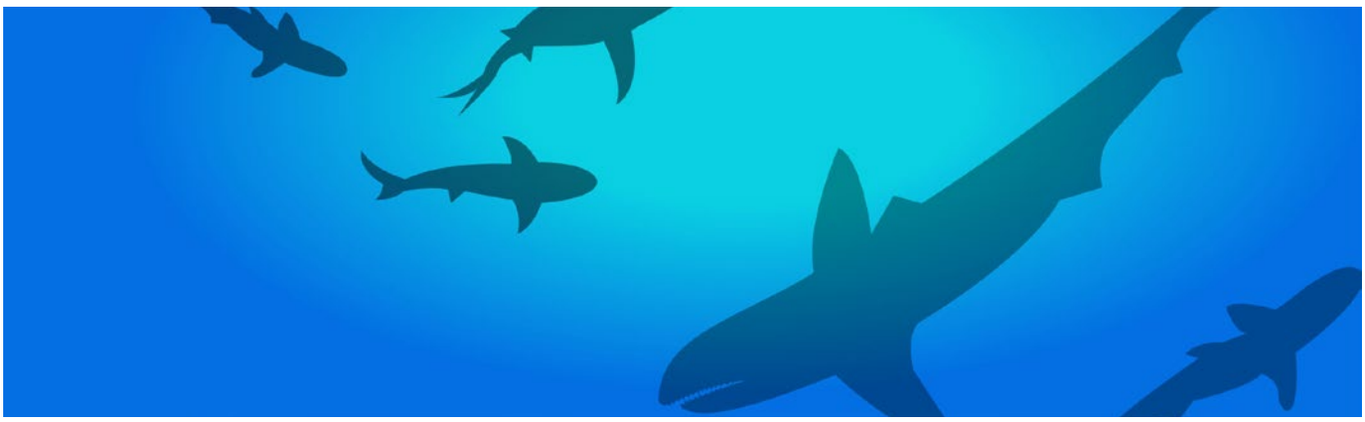
Lesson includes scientific writing activity

Dedicated assessment day

Lesson includes a discussion activity

Unit storyline: Animal and Plant Defenses

On the following pages, you'll find teacher and student sample pages and highlights of digital features for the "Animal and Plant Defenses" unit. Follow along with the print Teacher's Guide included in your sample or online with the digital Teacher's Guide.



Earth is inhabited by a staggering variety of animals and plants, with incredible variation in size, shape, color and parts. How does each of these kinds of living things continue to survive? How do their offspring survive? What does their survival have to do with the nearly endless variation we observe among living things?

All living things must meet their basic survival needs, including getting food, water, and oxygen, and avoiding being eaten by other animals. The body parts (structures) of animals and plants function in ways that enable living things to meet their survival needs. Understanding how structures help organisms and their offspring meet survival needs serves as a foundation for future learning about adaptations, inheritance, genetics, natural selection, and evolution.

Students take on the role of scientists advising an aquarium director by helping answer young visitors' questions about Spruce the Sea Turtle, who will soon be released back into the ocean. They investigate how Spruce can survive in the ocean, particularly since sharks live in the area. They then investigate a question about Spruce's offspring: *How can Spruce the Sea Turtle's offspring survive where there are sharks?* This context, which serves as the anchor phenomenon for the unit, provides concrete examples and motivation for students to discover the core ideas of the unit about how organisms and their offspring survive, particularly how they avoid being eaten.

Students gather evidence through careful observations of photographs and videos of real organisms and by reading science texts. Students create multiple models throughout the unit to explain their ideas about how defenses function. They apply their knowledge to two other challenges along the way—first by making a model that shows a way to defend the aquarium's animal food supply from being eaten by wildlife, and then by making a model of a sea creature's defense against being eaten. By the end of the unit, students will be able to use ideas of structure and function to explain how a wide variety of animals and plants and their offspring defend themselves from being eaten.

IN YOUR CLASSROOM

Sample unit walkthrough

Walkthrough progress PLAN TEACH ASSESS

Teacher sample page: Unit Overview

Unit Overview

Animal and Plant Defenses
Planning for the Unit

Unit Overview

What's in This Unit?

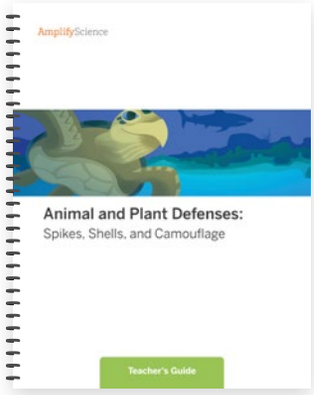
Earth is inhabited by a staggering variety of animals and plants, with incredible variation in size, shape, color and parts. *How does each of these kinds of living things continue to survive? How do their offspring survive? What does their survival have to do with the nearly endless variation we observe among living things?* All living things must meet their basic survival needs, including getting food, water, and oxygen, and avoiding being eaten by other animals. The body parts (structures) of animals and plants function in ways that enable living things to meet the their survival needs. Understanding how structures help organisms and their offspring meet survival needs serves as a foundation for future learning about adaptations, inheritance, genetics, natural selection, and evolution.

Students take on the role of scientists advising an aquarium director by helping answer young visitors' questions about Spruce the Sea Turtle, who will soon be released back into the ocean. They investigate how Spruce can survive in the ocean, particularly since sharks live in the area. They then investigate a question about Spruce's offspring: *How can Spruce the Sea Turtle's offspring survive where there are sharks?* This context, which serves as the anchor phenomenon for the unit, provides concrete examples and motivation for students to discover the core ideas of the unit about how organisms and their offspring survive, particularly how they avoid being eaten. Students gather evidence through careful observations of photographs and videos of real organisms and by reading science texts. Students create multiple models throughout the unit to explain their ideas about how defenses function. They apply their knowledge to two other challenges along the way—first by making a model that shows a way to defend the aquarium's animal food supply from being eaten by wildlife, and then by making a model of a sea creature's defense against being eaten. By the end of the unit, students will be able to use ideas of structure and function to explain how a wide variety of animals and plants and their offspring defend themselves from being eaten.

Why?

This unit presents an opportunity for students to delve deeply into understanding the structures that make up animals and plants, as well as how some of these structures can function as defenses against predators. Students think about what animals need to survive and grow—food, water, and oxygen, and avoiding getting eaten. Unlike many traditional approaches, this unit does not just ask students to memorize a list of survival needs or merely show examples of how organisms meet their needs. Students are asked to figure out how organisms meet their needs based on evidence from observing photographs, videos and text, and to demonstrate their understanding by creating models that explain how living things survive. They are encouraged to make their models scientific, leaving out extraneous features of the animal that do not relate to the structures and functions the models are meant to explain.

An aquarium setting was chosen for the unit for several reasons. First, life science curricula often focus on animals and plants that live on land and miss the opportunity to work with the incredible diversity of life available for study in the ocean. For some students, an aquarium may be a familiar place they have visited before. Another reason for choosing the aquarium setting, and particularly a sea turtle release program, is the precarious work of teaching children about living things. We want students to have the opportunity to consider a focal animal closely, but we needed to avoid the idea that wild animals need humans to "save" them by keeping them in captivity. Spruce, the focal sea turtle in this unit, is in the aquarium for a short period of time and will be released back into the ocean. Students are not in a position of helping Spruce; rather, they first seek to understand how she survives on her own and then use that information to explain how Spruce survives to the public.

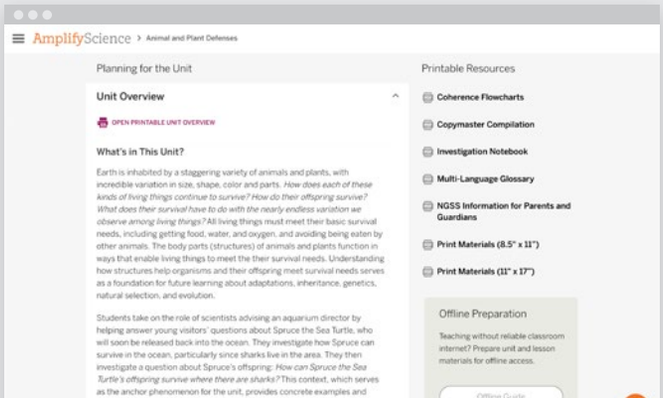


Find the Unit Overview in the exemplar Teacher's Guide included in your sample.

The Unit Overview provides you with an outline of the unit, including what the unit is about, why the unit was written this particular way, and how students will experience the unit. The Unit Overview is one of the most important documents for teachers to review before teaching a unit.

GO ONLINE

To access the Unit Overview in the digital Teacher's Guide, expand the "Unit Overview" section of the Unit Guide when you first click into a unit. The Unit Overview is also downloadable as a PDF.



Walkthrough progress PLAN TEACH ASSESS

Teacher sample page: Unit Map

Unit Map

Animal and Plant Defenses
Planning for the Unit

Unit Map

How can a sea turtle survive in the ocean after being released by an aquarium?

Working in their role as marine scientists, students apply their understanding of plant and animal defense structures as they explain to aquarium visitors how a sea turtle or other sea animals at the aquarium could defend themselves from ocean predators once they are released back into the wild.

Chapter 1: How does Spruce the Sea Turtle do what she needs to do to survive?

Students figure out: Sea turtles have body parts that help them get food, air, and water. In the ocean, there are predators that might try to eat the sea turtle. To survive in the ocean, she needs to avoid being eaten by predators.

How they figure it out: By watching videos of animals eating, reading about animals catching their meals in the wild, watering a plant, and closely observing their partners chewing and swallowing, students figure out that living things (including humans) use their body structures to meet their needs. Students review the basic survival needs of organisms through a game and are introduced to a new idea: to survive, animals and plants must avoid being eaten by other animals.

Chapter 2: How can Spruce the Sea Turtle survive where there are sharks?

Students figure out: The sea turtle has a shell and camouflage that enable her to defend herself from predators. The shell is hard, so predators can't eat her when they try to bite her. The camouflage allows her to blend in with her habitat, which makes it hard for predators to see her.

How they figure it out: Students read to find out that animal and plant structures perform specific functions. They observe photographs and videos of animals and plants defending themselves using shells, spines, and camouflage, then create models explaining their ideas about how these defenses work. The chapter ends with a biomimicry workshop in which students, informed by real animal and plant defenses, design ways to protect the sea turtle's food.

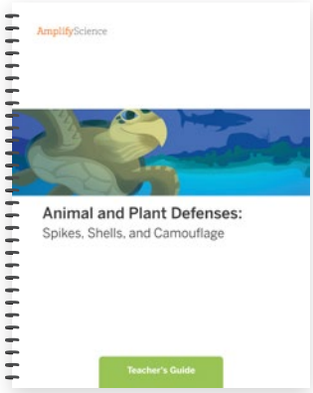
Chapter 3: How can Spruce the Sea Turtle's offspring survive where there are sharks?

Students figure out: When the sea turtle has offspring, they will not look exactly alike, but they will grow up to have hard shells and camouflage, just like their parents. These structures allow them to defend themselves from predators in the same way that the mother sea turtle does. This is because offspring defend themselves in the same way their parents do.

How they figure it out: Students use evidence from photos to compare offspring to parent organisms, then role-play interactions between parents and offspring. They read to find out that many animals need their parents to survive while they are young, and that plants grow up without parental care.

Chapter 4: How can aquarium scientists explain animal defenses to visitors?

Students figure out: Models highlight the important parts of what we are trying to explain and help communicate ideas clearly. A model of sea turtle defenses should either show how a hard shell stops a predator from biting and eating a sea turtle or how camouflage makes a sea turtle difficult to see so predators cannot find and eat it. Models do not need to show the parts of a sea turtle that are not part of its defense.

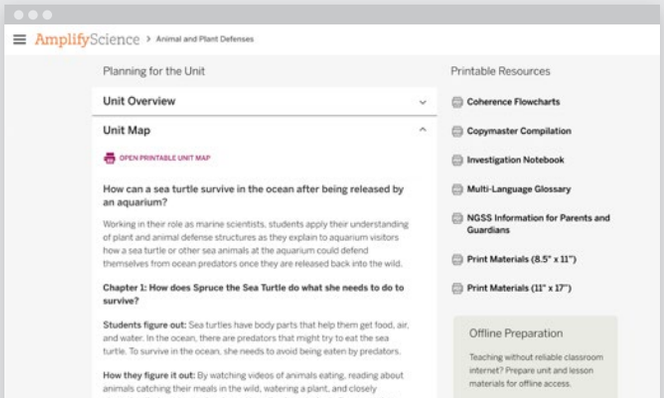


Find the Unit Map in the exemplar Teacher's Guide included in your sample.

The Unit Map is a summary that shows teachers how chapters within the unit build upon each other, what questions students will investigate, and what evidence sources they will use to figure those questions out.

GO ONLINE

To access the Unit Map in the digital Teacher's Guide, expand the "Unit Map" section of the Unit Guide when you first click into a unit. The Unit Map is also downloadable as a PDF.



Walkthrough progress PLAN TEACH ASSESS

Teacher sample page: Instructional Guide

Lesson 1.2
Activity 1

Animal and Plant Defenses
Lesson Guides

1 READING
Reading: Tortoise Parts

Reading: Tortoise Parts

20 MIN

The teacher leads a Shared Reading of *Tortoise Parts* and introduces the strategy of visualizing while reading.

Instructional Guide

1. Revisit the aquarium.

We have been working as aquarium scientists to help the aquarium director. We are trying to help the director explain to kids who visit the aquarium how sea turtles, like Spruce, survive in the ocean.

2. Connect to prior learning.

In our last lesson, we thought about what animals and plants need to do to survive. During the Survival Game, we figured out that animals and plants need certain things to survive. What did we learn that animals and plants need to survive?
[They need to get air. They need to get water. They need to get food.]

Spruce the Sea Turtle is an animal. Just like other living things, she needs to get air, water, and food to survive. Now we can work to figure out how Spruce gets these things that she needs to survive.

3. Introduce the Investigation Question. Discuss how scientists often ask follow-up questions to help them learn about their first question.

Sometimes, scientists ask other questions that can help them answer part of the first question they asked. As scientists, we need to figure out how animals and plants do what they need to do to survive.

Read aloud the Investigation Question you have written on the board, pointing to each word.

How do animals and plants do what they need to do to survive?

4. Introduce the book *Tortoise Parts*.

Classroom Slides, Lesson 1.2

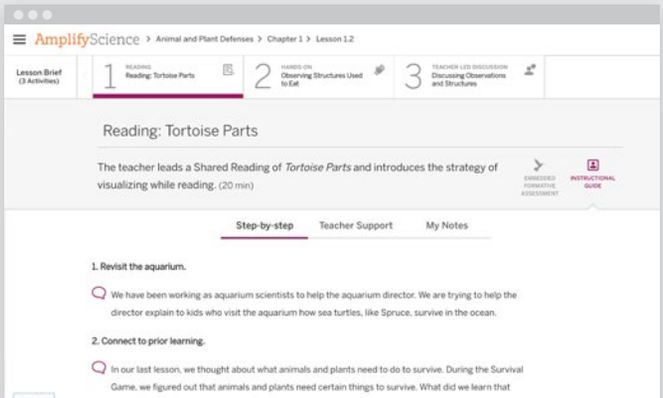
Find the Instructional Guide for Lesson 1.2 in the exemplar Teacher's Guide included in your sample.

The Instructional Guide contains step-by-step instructions for teachers, including teacher talk and discussion prompts.

In Lesson 1.2 of *Animal and Plant Defenses*, teachers introduce Tortoise Parts, which students will read with the purpose of making sense of how tortoises do what they need to do to survive.

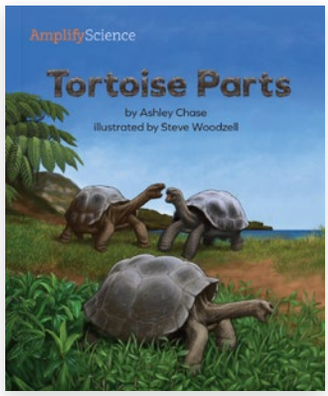
GO ONLINE

To access the Instructional Guide in the digital Teacher's Guide, click on any activity within a Lesson.



Walkthrough progress PLAN TEACH ASSESS

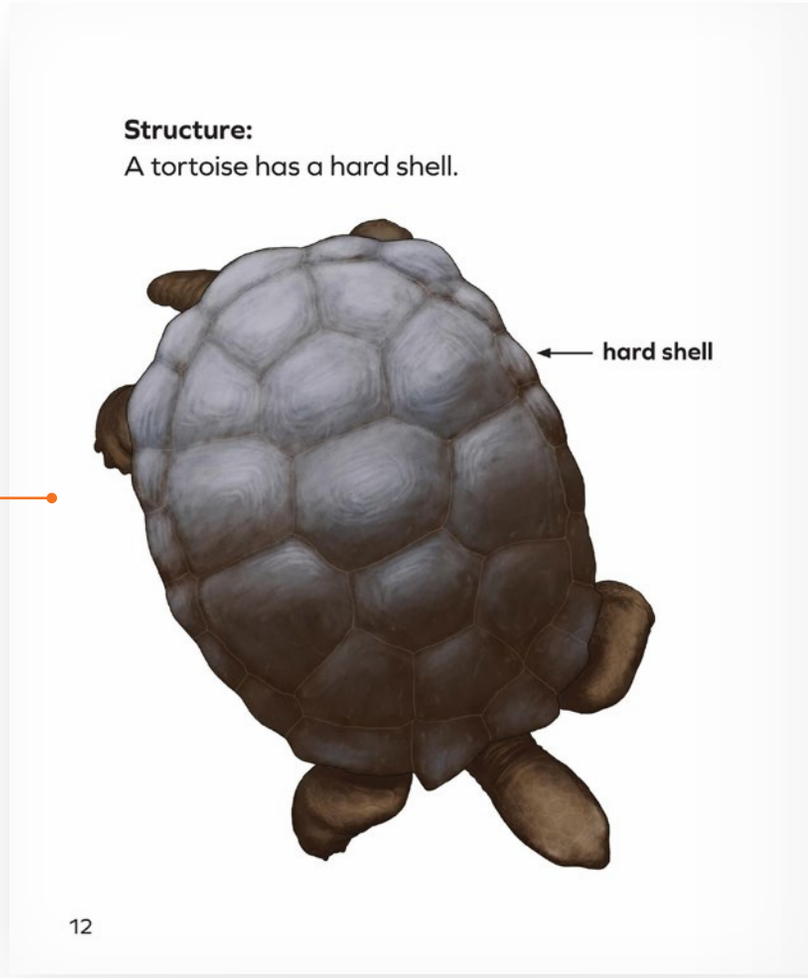
Student sample page: Student Book



Find the Student Book *Tortoise Parts* in your sample and turn to page 12.

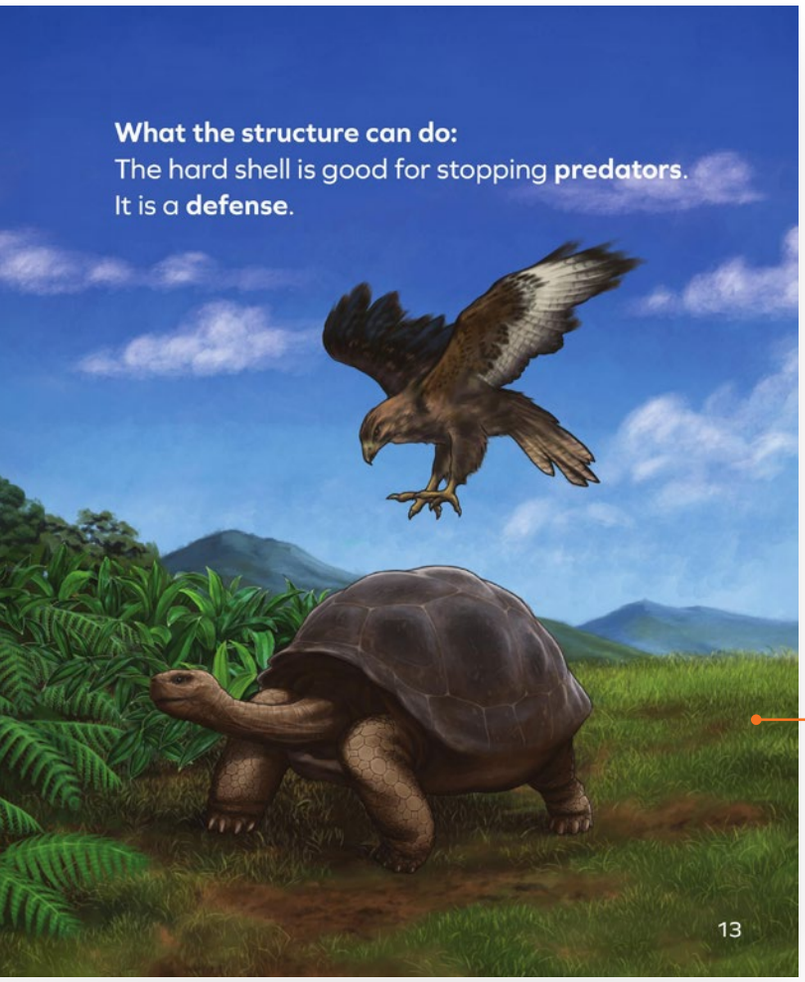
Tortoise Parts introduces the idea that animals use specific body parts to meet their survival needs.

In this lesson, the teacher leads a Shared Reading of the book in order to introduce the reading strategy of visualizing. Students will revisit the book for different purposes later in the unit. After this reading, the word *structure*, which is one of the unit's vocabulary words, is formally introduced to students and posted to the classroom wall.



GO ONLINE

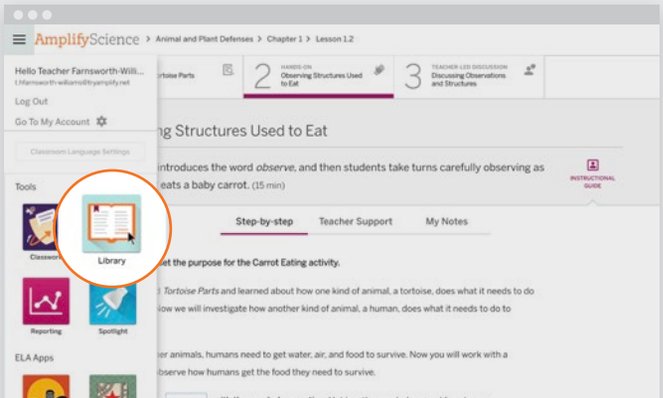
Student Books are accessible digitally via the Library in the Global Navigation Menu on the left side of the screen.



Classroom Slides, Lesson 1.2

Find the Student Book *Tortoise Parts* in your sample and turn to page 13.

In Lesson 1.2, the teacher models visualizing external structures (in this case, turtles' bodies) during a read-aloud of *Tortoise Parts*.



Walkthrough progress PLAN TEACH ASSESS

Teacher sample page: Hands-on activity

Lesson 2.3
Activity 2

Animal and Plant Defenses
Lesson Guides

2 HANDS-ON
Modeling Defenses

Modeling Defenses

20 MIN

Partners use a ball of clay, a comb, and various materials to model structures that animals and plants use to defend themselves from being eaten.

SAFETY NOTE

Safety Note: Toothpicks
Caution students about how to safely use the toothpicks. Point out that students should never poke themselves or others with the pointy end of the toothpicks, and they should not break the toothpicks into smaller pieces because the toothpicks will splinter. To prevent students from poking their fingers as they work, demonstrate how to gently use the investigation materials, such as the hair comb, when creating the defense models. In subsequent lessons in which students use toothpicks with their defense models, remind them to handle the toothpicks safely.

Instructional Guide

1. Introduce the modeling activity.

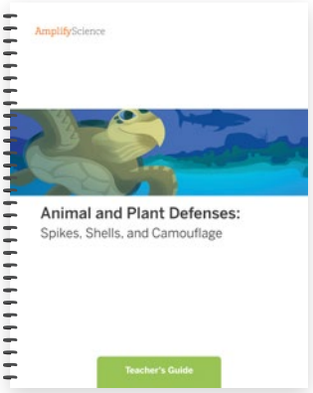
The reference book helped us gather information about how animals and plants might use their structures to not be eaten.

Scientists gather evidence from books and from hands-on investigations.

Now we will use some materials to explore and gather more information about how living things might use their structures to not be eaten.

2. Introduce and explain using the clay and comb.

- Display the clay

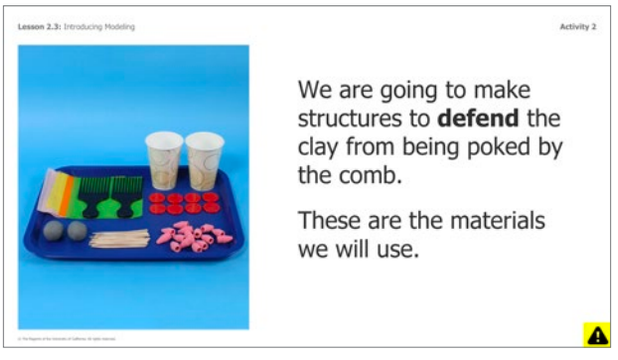


Turn to the Instructional Guide for Lesson 2.3 in the exemplar Teacher's Guide included in your sample.

In Lesson 2.3, students participate in a hands-on activity to model defenses in animals.

The lesson begins with students browsing the reference book *Spikes, Spines, and Shells* to prepare students to create models of animal and plant defenses later in the lesson.

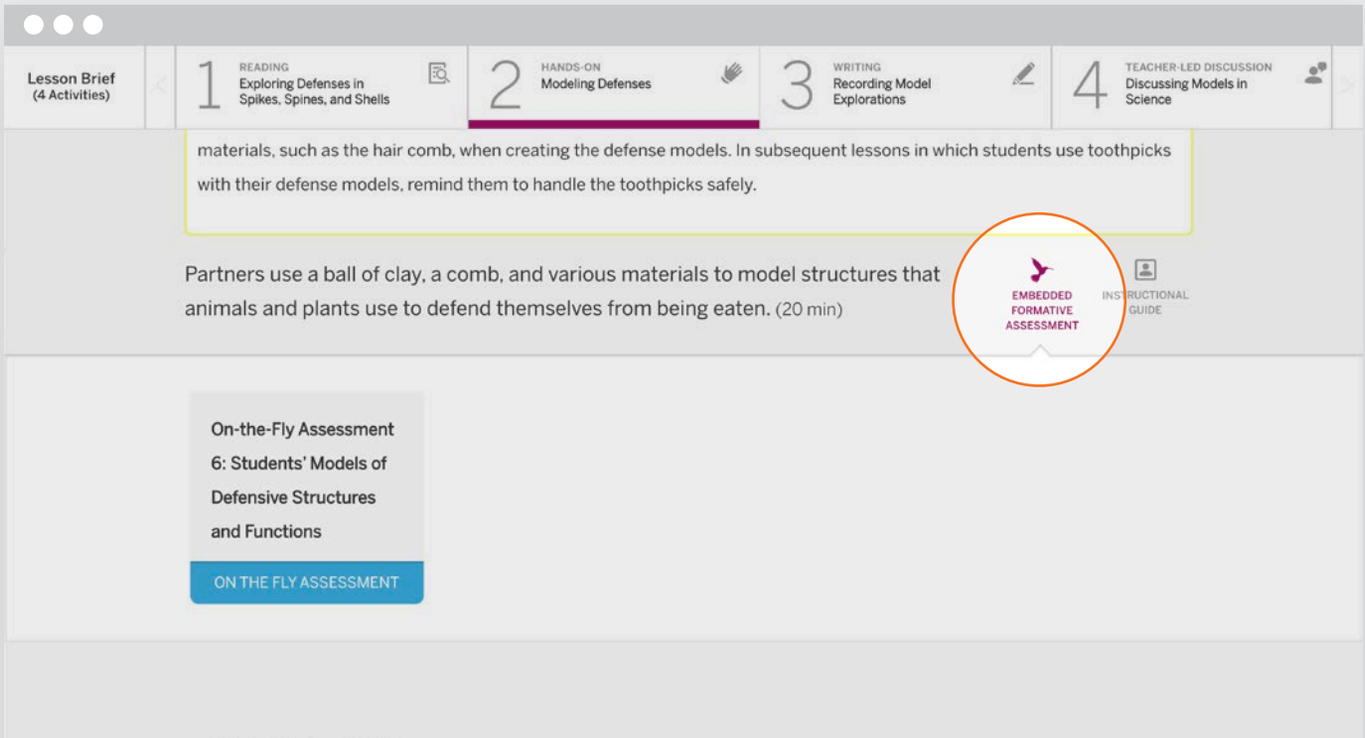
In the hands-on activity, partners work with a variety of materials to model structures that animals and plants use to defend themselves from being eaten. This modeling activity provides a foundation for subsequent modeling activities throughout Chapter 2.



Classroom Slides, Lesson 2.3

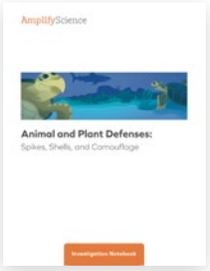
GO ONLINE

Lesson 2.3 includes an embedded formative assessment, or On-the-Fly Assessment. Teachers can access these assessments within the digital Teacher's Guide by clicking the bird icon in the Instructional Guide for the lesson.



Walkthrough progress PLAN TEACH ASSESS

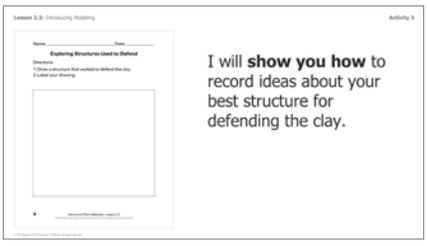
Student sample page: Student Investigation Notebook



Turn to page 4 in the *Animal and Plant Defenses* Student Investigation Notebook included in your sample.

After students complete their models of animal defenses in Lesson 2.3, they draw structures that worked as a defense and then label the structures by using word rings.

This recording activity provides an opportunity for students to practice important vocabulary and to learn more about how scientists use models.



Classroom Slides, Lesson 2.3

Name: _____ Date: _____

Exploring Structures Used to Defend

Directions:

1. Draw a structure that worked to defend the clay.
2. Label your drawing.

4 Animal and Plant Defenses—Lesson 2.3

GO ONLINE

The full Student Investigation Notebook can be accessed digitally from the Unit Guide.

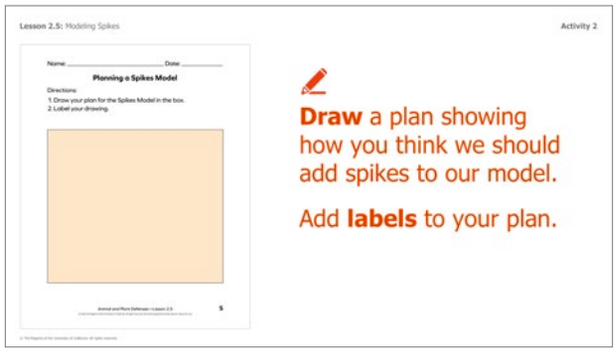
Name: _____ Date: _____

Planning a Spikes Model

Directions:

1. Draw your plan for the Spikes Model in the box.
2. Label your drawing.

Animal and Plant Defenses—Lesson 2.5 **5**

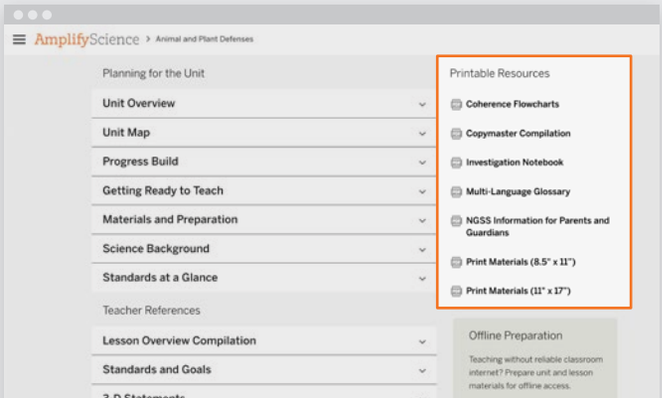


Classroom Slides, Lesson 2.5

Turn to page 5 in the *Animal and Plant Defenses* Student Investigation Notebook included in your sample.

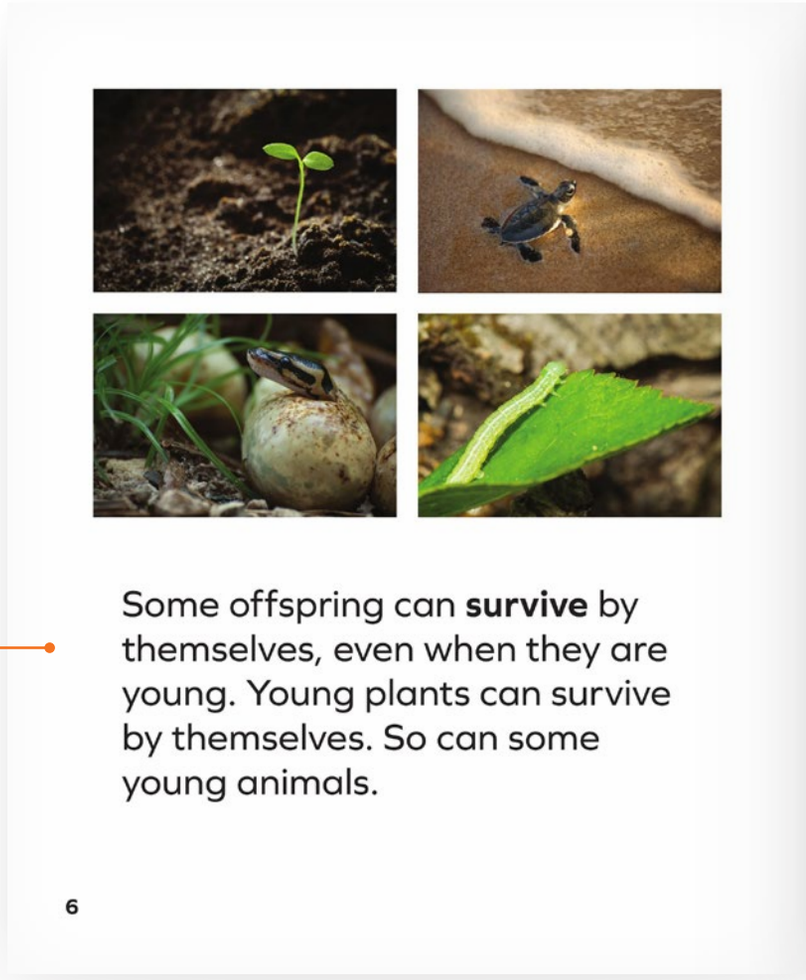
In Lesson 2.5, students use this same strategy to plan which materials would be most effective for creating a model of spikes as a defense. Students draw and label their plan in their Investigation Notebook and then share their plans.

The teacher creates a Spikes Model based on students' ideas, which students can use to show how spikes work as a defense.



Walkthrough progress PLAN TEACH ASSESS

Student sample page: Student Book



Find the *Parents and Offspring* Student Book in your sample and turn to page 6.

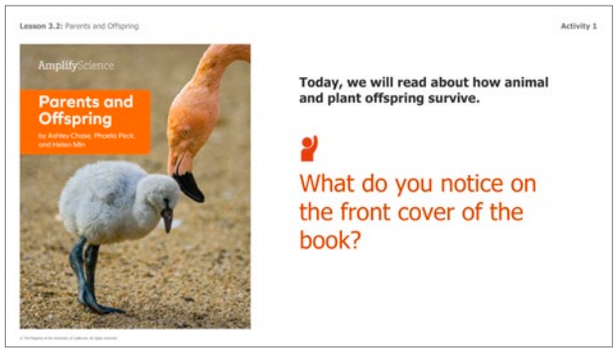
In Lesson 3.2, students add to their understanding of how animals protect themselves by reading about animal parents and their offspring. The reading in this lesson helps students figure out that grown animal offspring survive in the same way as their parents.

GO ONLINE

Print materials, including the Parent and Offspring cards used in this lesson, are available to download as PDFs from the Unit Guide. Printed copies are also included in the unit materials kit.

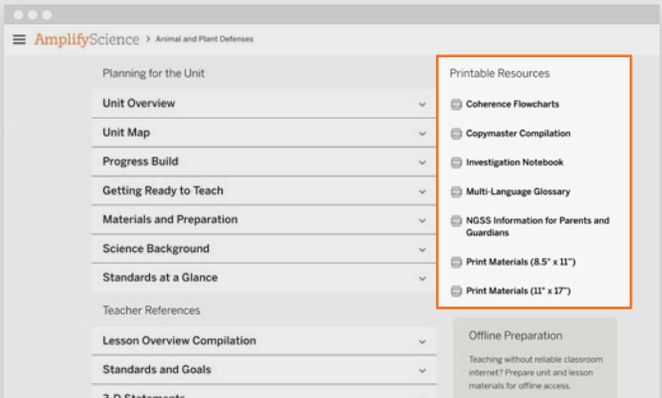
Some offspring need help to survive. Their parents take care of them. When the offspring grow up, they take care of themselves.

7



Classroom Slides, Lesson 3.2

This reading sets the stage for a closer look at offspring's defenses during the rest of the lesson, which includes a teacher-led discussion and acting out the defenses of grown animal and plant offspring in a movement routine. Students also use Parents and Offspring cards to describe how grown offspring defend themselves.



Walkthrough progress PLAN TEACH ASSESS

Teacher sample page: Videos

Lesson 3.4
Teacher Activity

Animal and Plant Defenses
Lesson Guides

TEACHER
Videos of Young Offspring

Videos of Young Offspring

15 MIN

Students observe video evidence of young animal and plant offspring that survive on their own.

Instructional Guide

1. Highlight the need for more evidence.

We have some evidence from the book that the offspring of some kinds of animals survive on their own, but the book was mostly about animal offspring that get help from their parents to survive.

Let's think about how young offspring can survive by themselves. Let's observe videos to get more evidence about how young offspring survive.

2. Set the purpose for watching the videos. Explain to students that for each video they observe, they should think about the structures each young offspring uses to survive. Let them know that, unlike the other times they watched videos, they will watch each video only once. Explain that this is because there are three videos to watch.

3. Introduce the Fish Offspring video. Explain that this video shows young fish offspring, which survive without any parent nearby.

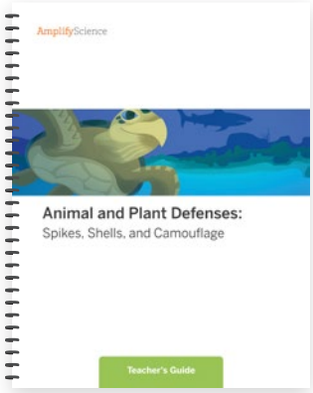
This type of fish lives in a sea anemone. The sea anemone in this video is a living thing that looks like it is made of tubes. The young fish offspring in this video are eating tiny plants that grow on the anenome.

4. Play the Fish Offspring video.

What structures did you observe these young fish offspring have that help them survive by themselves? [Mouths for eating, tails for swimming, and maybe camouflage for not being found by predators.]

These young fish offspring have structures to help them do what they need to do to survive. They do not need help from their parents to survive.

5. Introduce the Plant Offspring video. Explain that this video shows many young plant offspring growing.



Turn to the Instructional Guide for Lesson 3.4 in the exemplar Teacher's Guide included in your sample.

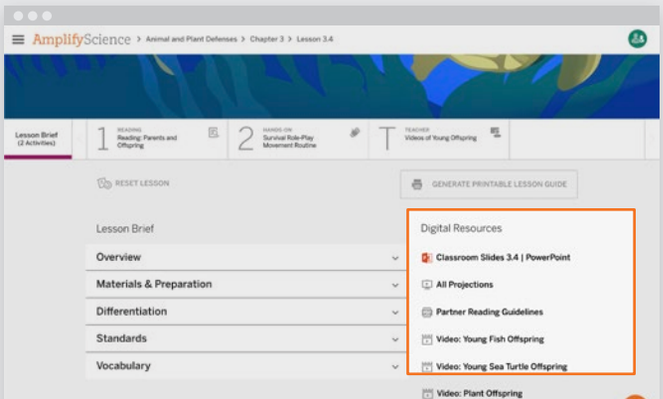
In Lesson 3.4, the teacher introduces a new Investigation Question that frames the work students will do in the next two lessons.

Partners reread the *Parents and Offspring* Student Book and use the visualizing strategy to make sense of what parents and offspring do to help young offspring survive.

Lesson 3.4 ends with the teacher showing three videos that provide students with evidence that some kinds of young offspring, including sea turtles like Spruce's offspring, can survive without parental help.

GO ONLINE

Videos can be downloaded before class from the Digital Resources section of the Lesson Brief. They can also be launched directly from the lesson's Instructional Guide.


AmplifyScience
Animal and Plant Defenses
Chapter 3
Lesson 3.4
Lesson Brief (2 Activities)
1 Reading: Parents and Offspring
2 Survival Role-Play Movement Routine
Videos of Young Offspring
RESET LESSON
GENERATE PRINTABLE LESSON GUIDE
Lesson Brief
Overview
Materials & Preparation
Differentiation
Standards
Vocabulary
Digital Resources
Classroom Slides 3.4 | PowerPoint
All Projections
Partner Reading Guidelines
Video: Young Fish Offspring
Video: Young Sea Turtle Offspring
Video: Plant Offspring

Walkthrough progress PLAN TEACH ASSESS

Teacher and student sample page: End-of-Unit Assessment

Animal and Plant Defenses
Lesson Guides

Lesson 4.4
Activity 1

1 TEACHER-LED DISCUSSION
Talking with Students About Their Animals and Models

Talking with Students About Their Animals and Models

The teacher meets with students individually and discusses their chosen animals and the models of their animals' defenses.

Instructional Guide

1. Have students sit with you, one at a time, with *Spikes, Spines, and Shells* and their Aquarium Exhibit Model between you.

2. Introduce the task—to explain how students' modeled animals survive.

We have learned a lot about how animals and plants survive where there are other animals that try to eat them. You have chosen one ocean animal to model to help show aquarium visitors how that animal defends itself from predators. I am going to ask you to explain to me, just like you might explain to a visitor who does not know much about your animal, how the ocean animal survives. I also want you to explain how your model shows how that happens.

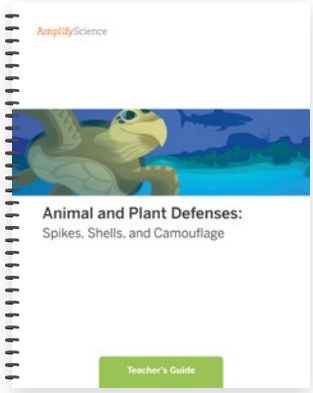
What animal did you choose to model?
[Sea turtle. Sally Lightfoot crab. Puffer fish. Lionfish.]

3. Prompt students to explain how their chosen animals survive. Open *Spikes, Spines, and Shells* to the appropriate page for that student's chosen animal and place the picture between you.

The animal you chose lives in the ocean where there are other animals that try to eat it. How does it survive with those animals around?

4. Ask follow-up questions to probe for ideas that students did not mention. If students do not mention ideas that were the focus of the unit, they may still have some understanding of those ideas, even if they did not independently use them in their explanations. You can ask the following questions to probe for ideas that students did not include.

- If the student does not mention that the animal needs to avoid being eaten, ask this follow-up question.



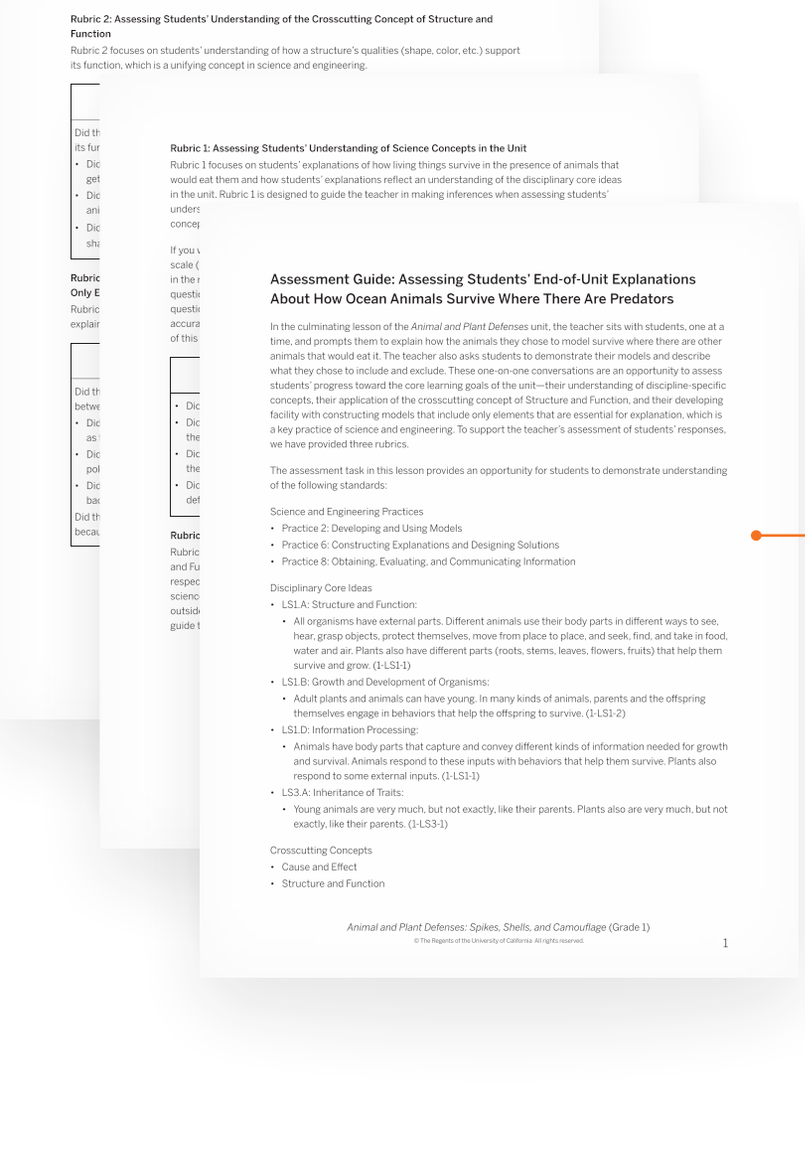
Find the Instructional Guide for Lesson 4.4 in the exemplar Teacher's Guide included in your sample.

After giving oral explanations of models while acting as aquarium scientists in Lesson 4.3, the teacher meets with students individually in Lesson 4.4 while students explain how their chosen animals survive where there are predators.

Students also explain how their models represent their ideas.

GO ONLINE

Navigate to the Lesson Brief for Lesson 4.4 and download the Assessment Guide from the Digital Resources section on the right side of your screen.



Rubric 2: Assessing Students' Understanding of the Crosscutting Concept of Structure and Function

Rubric 2 focuses on students' understanding of how a structure's qualities (shape, color, etc.) support its function, which is a unifying concept in science and engineering.

Rubric 1: Assessing Students' Understanding of Science Concepts in the Unit

Rubric 1 focuses on students' explanations of how living things survive in the presence of animals that would eat them and how students' explanations reflect an understanding of the disciplinary core ideas in the unit. Rubric 1 is designed to guide the teacher in making inferences when assessing students'

Assessment Guide: Assessing Students' End-of-Unit Explanations About How Ocean Animals Survive Where There Are Predators

In the culminating lesson of the *Animal and Plant Defenses* unit, the teacher sits with students, one at a time, and prompts them to explain how the animals they chose to model survive where there are other animals that would eat it. The teacher also asks students to demonstrate their models and describe what they chose to include and exclude. These one-on-one conversations are an opportunity to assess students' progress toward the core learning goals of the unit—their understanding of discipline-specific concepts, their application of the crosscutting concept of Structure and Function, and their developing facility with constructing models that include only elements that are essential for explanation, which is a key practice of science and engineering. To support the teacher's assessment of students' responses, we have provided three rubrics.

The assessment task in this lesson provides an opportunity for students to demonstrate understanding of the following standards:

Science and Engineering Practices

- Practice 2: Developing and Using Models
- Practice 6: Constructing Explanations and Designing Solutions
- Practice 8: Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas

- LS1.A: Structure and Function:
  - All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)
- LS1.B: Growth and Development of Organisms:
  - Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)
- LS1.D: Information Processing:
  - Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)
- LS3.A: Inheritance of Traits:
  - Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1)

Crosscutting Concepts

- Cause and Effect
- Structure and Function

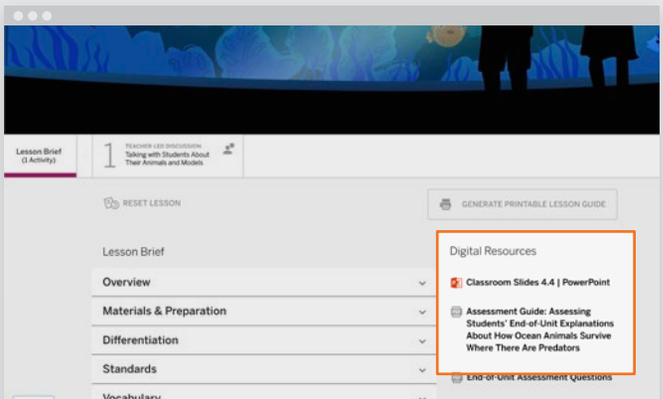
Animal and Plant Defenses: Spikes, Shells, and Camouflage (Grade 1)

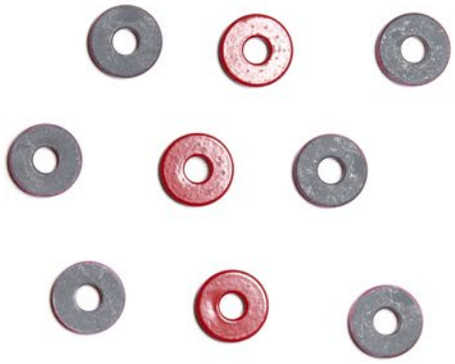
1

Using an Assessment Guide that is downloaded from the Lesson Brief, teachers assess students' final explanations.

Rubrics are provided for assessing students' understanding of:

- science concepts in the unit.
- the crosscutting concept of structure and function.
- the practice of constructing models that include only essential elements.





Let's go in the house.
We can use our blanket.
We can make a fort.

14

It is dark in our fort.
Now we need some light!

We found a light **source**.
Can you see us?

15

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For more information on Amplify Science, visit **amplify.com/sciencek5**.

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