AmplifyScience



Participant Notebook

Unit Internalization / Guided Planning



Three dimensional learning reference



3-D learning engages students in using scientific and engineering practices and applying crosscutting concepts as tools to develop understanding of and solve challenging problems related to disciplinary core ideas.

Science and Engineering Practices

- 1. Asking Questions and Defining Problems
- 2. Developing and Using Models
- 3. Planning and Carrying Out Investigations
- 4. Analyzing and Interpreting Data

- 5. Using Mathematics and Computational Thinking
- 6. Constructing Explanations and Designing Solutions
- 7. Engaging in Argument from Evidence
- 8. Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas

Earth and Space Sciences:

- Earth's Place in the Universe
- Earth's Systems
- Earth and Human Activity

Life Sciences:

- From Molecules to
- Organisms
- Ecosystems
- HeredityBiological Evolution

Physical Sciences:

- Matter and its
 Interactions
- Motion and Stability
- Energy and their
 Applications

Engineering, Technology and the Applications of Science:

- Engineering Design
- Links among Engineering Technology, Science and Society

Crosscutting Concepts

- 1. Patterns
- 2. Cause and Effect
- 3. Scale, Proportion, and Quantity
- 4. Systems and System Models

- 5. Energy and Matter
- 6. Structure and Function
- 7. Stability and Change

Year at a glance

Units per year



Unit types

Although every Amplify Science unit provides a three-dimensional learning experience, each unit emphasizes one of the following specific science and engineering practices.

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 provide extra support to students engaging 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.

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 provide extra support to students engaging in the practice of argumentation. As students move up the K–5 grades, they focus on important aspects of argumentation in an intentional sequence.

Course structure

Key

Argumentation Investigation Engineering design
 Modeling

Kindergarten (66 lessons)

Needs of Plants and Animals **22 lessons** ① Pushes and Pulls **22 lessons** ③ Sunlight and Weather **22 lessons** Ø

Grade 1 (66 lessons)

Animal and Plant Defenses **22 lessons** Light and Sound **22 lessons** Spinning Earth **22 lessons 1**

Grade 2 (66 lessons)

Plant and Animal Relationships **22 lessons** ① Properties of Materials **22 lessons** ③ Changing Landforms **22 lessons** Ø

Grade 3 (88 lessons)

Balancing Forces **22 lessons** (1) Inheritance and Traits **22 lessons** (1) Environments and Survival **22 lessons** (2) Weather and Climate **22 lessons** (A)

Grade 4 (88 lessons)

Energy Conversions 22 lessons Vision and Light 22 lessons Earth's Features 22 lessons Waves, Energy, and Information 22 lessons

Grade 5 (92 lessons)

Patterns of Earth and Sky 22 lessons
Modeling Matter 22 lessons
The Earth System 26 lessons
Ecosystem Restoration 22 lessons
A

K-5 Navigation structure

				unit	ALC: N
nits (each unit	includes 3–6 chapter	s)			
crupter	chapter.	chapter	chapter	chapter	chapter
6	2	5	antiperet.		
hapters (ee	ich chapter includes 2	2-10 lessons)			

K-5 Program components

The K-5 program contains both physical and digital instructional materials. The table below describes materials and, when applicable, includes links to find additional information.

Teacher materials

Teacher's Guide	Contains all of the unit's lesson plans, differentiation strategies, and an assortment of instructional supports and resources at the unit, lesson, and individual activity level (also available in print for purchase): <u>bit.ly/amplifyk5navigation</u>
Classroom Slides	Each lesson has a downloadable and editable PowerPoint or Google Slides file to help guide teachers and students through the lesson: <u>bit.ly/amplifyslideshowto</u>
Classroom Wall materials	The printed Classroom Wall materials can be found in the unit kit. PDFs are also provided in the digital Teacher's Guide: <u>bit.ly/amplifyclassroomwall</u>
Embedded assessments	Includes formal and informal opportunities for students to demonstrate understanding and for teachers to gather information: <u>bit.ly/amplifyk5assessment</u>
Program Guide	A resource for finding out more about the program's structure, components, supports, how it meets the standards, and flexibility: <u>bit.ly/amplifyprogramguide</u>
Program Hub	Features remote learning resources, training videos, hands-on investigation videos, and Professional Learning resources: <u>bit.ly/amplifyprogramhub</u>

Student materials

Hands-on materials	The unit kit includes both consumable and non-consumable physical materials used for the hands-on activities that are carried out at strategic points throughout the unit. <u>bit.ly/amplifymaterials</u>
Investigation Notebooks	Contains instructions for student activities and space for students to record data, reflect on ideas from texts and investigations, and construct explanations and arguments: <u>bit.ly/amplifyk5fillable</u>
Student books	Informational texts written by the Lawrence Hall of Science allow students to practice reading within the science content area: <u>bit.ly/amplifystudentbooks</u>
Digital applications	Digital tools and simulations, available across grades 2–5, support and advance learning objectives by giving students opportunities to analyze data, visualize phenomena, and share their thinking: <u>bit.ly/amplifydigitaltools</u>

Curriculum add-ons

Spanish-language licenses	Spanish materials that mirror their English counterparts in both content and quality are also available for purchase: <u>bit.ly/amplifyspanish</u>
Interactive Classroom	A new digital interface for teachers and students designed for classrooms in which every student has a digital device: <u>bit.ly/amplifyinteractiveclassroom</u>

Unit Level resources

The Unit Level resources aim to quickly familiarize teachers with the unit's content, structure, and materials. It is recommended that teachers read through the Planning for the Unit documents, and consult the Teacher References as necessary. Some of the Unit Level resources include:

Planning for the Unit

Unit Overview	Describes what's in each unit and how students learn across chapters
Unit Map	An overview of what students figure out by chapter and how they figure it out
Progress Build	Explains the learning progression of ideas students figure out in the unit
Materials and Preparation	Lists materials included in the unit's kit, items to be provided by the teacher, and briefly outlines preparation requirements for each lesson
Science Background	Adult-level primer on the science content students figure out in the unit

Teacher References

Lesson Overview Compilation	Lesson Overview of each lesson in the unit, including lesson summary, activity purposes, and timing
3-D Statements	Describes 3-D learning across the unit, chapters, and in individual lessons
Assessment System	Describes components of the Amplify Science Assessment System
Embedded Formative Assessments	Includes full text of formative assessments in the unit
Books in This Unit	K-5: Summarizes each unit text and explains how the text supports instruction
Articles in This Unit	6-8: Summarizes each unit text and explains how the text supports instruction
Apps in This Unit	2-8: Outlines functionality of digital tools and how students use them

Printable Resources

Coherence Flowcharts	Visualization of how all of the different parts of a chapter connect and flow into one another so that students are able to figure out the unit phenomenon
Investigation Notebook	Digital version of the Investigation Notebook, for copying and projecting. The PDFs are fillable, so students can also complete their work digitally.
Article Compilation	6-8: Downloadable PDF with all of the unit's science articles in one document
Copymaster Compilation	Downloadable PDF with all of the unit's copymasters in one place
Print Materials	A digital copy of the Print Materials included in the Unit Kit

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.



How they figure it out: Students read about and evaluate a model of frog defenses for effectiveness and clarity. Keeping these criteria in mind, they design and build their own models that will communicate to visitors how one of four sea animals defends itself. Students showcase their ideas by explaining their models at an exhibition held for classroom visitors.

Coherence Flowchart structure



The explanation that students can make to answer the chapter question.

Instruction is framed by questions about the unit's anchor phenomenon and the related problem students are solving. Chapter Questions then guide students in figuring out the phenomenon, piece by piece. Within each chapter. Investigation Questions focus students on a manageable piece of content that will help them figure out the Chapter Question. Each question motivates activities, and each activity provides specific evidence related to the Investigation Question. Students synthesize the understanding constructed over multiple activities, and this understanding is formalized through key concepts. Often a key concept leads students to an additional Investigation Question students need to pursue to answer the Chapter Question. At the end of the chapter, students' new understanding is applied back to the unit's anchor phenomenon and leads students to a new Chapter Question or a final explanation.



Unit level internalization notes

Classroom Slides reference

Classroom Slides are a resource designed to make planning and teaching with Amplify Science faster and easier. Each lesson has editable slides optimized for **Microsoft PowerPoint Version 16 and Google** to help guide teachers and their students through the lesson with easy-to-follow images, videos, questions, and instructions.

This reference sheet has basic information to get you started. For a more in-depth how-to? Go to: https://tinyurl.com/amplifyslideshowto

Helpful tips:

The text on the slides is color coded! Black text on the slides denotes suggested teacher talk. Orange text on the slides denotes a student action.

Icons on the slide cue the teacher about what is happening in the lesson. Here's what the icons on the slides mean:



You may occasionally also come across the following student action icons:



In addition to the text and visuals on the slide, each slide's notes field contains additional information, including possible student responses, follow-up prompts, and instructional steps. In most cases, the content on the slide is meant to come before the actions and suggested teacher talk written in the notes. Here's what the icons in the notes field mean:



Lesson level internalization notes

Assessment System reference (grades K-1)

Assessment type	Description	Student experience	Teacher resources
Pre-Unit Assessment	Formative, 3-D performance assessment meant to gauge students' initial understanding and pre- conceptions about core ideas in the unit	 Full-class teacher-led discussion, supported by visual cues 	 Assessment Guide (available in Digital Resources)
End-of-Unit Assessment	Summative, 3-D performance assessment to evaluate students' understanding of core ideas in the Progress Build	 Full-class teacher-led discussion, supported by visual cues 	 Rubric and Possible Responses in Assessment Guide (available in Digital Resources)
Critical Juncture Assessments	Embedded formative assessments for assessing students' progress along the Progress Build	 Activities are embedded into existing instructional activities leveraged for assessment opportunities often student-to-student discussions, investigations, or modeling activities 	 Full text of assessment includes "Assess Understanding" section and "Tailor Instruction" suggestions accessible in Instructional Guide by clicking the hummingbird icon All Critical Juncture Assessments are included in Reference: Embedded Formative Assessments (available in the Unit Level resources) Clipboard Assessment Tool includes tailored sets of questions and the specific activities that present an opportunity to ask those questions. Also included is space to write notes about students' ideas. Augmenting Instruction notes (accessible in Teacher Support tab) provide additional suggestions for supplemental instruction at the class, group, and student level
On-the-Fly Assessments	Embedded formative assessments for noting students' progress with one or more of the following: science disciplinary core ideas, science and engineering practices, crosscutting concepts, sense-making strategies, and collaborative science work	 Activities are embedded into existing instructional activities, leveraged for assessment opportunities. Artifacts can include full- class or student-to-student discussion, kinesthetic activities, notebook pages, etc. 	 Full text of assessment includes what to "Look for" and "Now What?" instructional suggestions accessible in Instructional Guide by clicking the hummingbird icon All On-the-Fly Assessments are included in Reference: Embedded Formative Assessments (available in the Unit Level resources) Clipboard Assessment Tool includes tailored sets of questions and the specific activities that present an opportunity to ask those questions. Also included is space to write notes about students' ideas.

Assessment System reference (grades K-1) cont.

Assessment type	Description	Student experience	Teacher resources
Student Self- Assessments	Opportunity for students to reflect on whether they understand or don't yet understand the core concepts from the unit	 Reflection prompts through teacher-led discussion and partner talk Provided at or near the end of each chapter 	 Information about Student Self-Assessments in Reference: Assessment System (in Unit Overview) Teacher Support Notes accessible in Instructional Guide by clicking the Teacher Support tab Discussion prompts in the Instructional Guide
Investigation Assessments	Summative, 3-D performance assessment to evaluate students' performance of the science and engineering practices of Planning and Carrying Out Investigations and Analyzing and Interpreting Data, as well as their application of disciplinary core ideas and crosscutting concepts	 Prompts for planning investigation and recording results in the Investigation Notebook or a copymaster (available in Digital Resources). Additional support and spoken teacher prompts in K-1. Physical materials for conducting investigation 	 Rubrics and Possible Responses in Assessment Guide (available in Digital Resources) Possible Responses also accessible in Instructional Guide by clicking the Possible Responses tab
Portfolio Assessments	Opportunity for students to compile and reflect on key work products collected at the end of each unit. Final portfolio compilation occurs at the end of the school year and allows students to select and reflect on work products which they feel best demonstrate their growth in understanding throughout the year	 Compilation of work products that show growth over the course of the year Reflection on chosen work products Rubrics for evaluating work products (available in Program Guide → Assessments → Additional Assessment Resources) 	 Assessment Rubrics (available in Program Guide → Assessments → Additional Assessment Resources) Guidance for communicating to parents about student progress (available in Program Guide → Assessments → Additional Assessment Resources)

Additional Amplify resources

Program Guide

Additional insight into the program's structure, intent, philosophies, supports, and flexibility.

https://my.amplify.com/programguide

California Edition: http://amplify.com/science/california/review

Louisiana Edition: https://my.amplify.com/programguide/content/louisiana/welcome/elementaryschool/

Amplify Help

Frequently updated compilation of articles with advice and answers from the Amplify team.

my.amplify.com/help

Caregivers Site

https://amplify.com/amplify-science-family-resource-intro/

Amplify Support

Contact the Amplify support team for information specific to enrollment and rosters, technical support, materials and kits, and teaching support, weekdays 7AM-10PM EST and weekends 10AM-6PM EST.

Email: help@amplify.com

Email: edsupport@amplify.com (pedagogical questions)

Phone: 800-823-1969

Or, reach Amplify Chat by clicking the

icon at the bottom right of the digital Teacher's Guide.

When contacting the support team:

- Identify yourself as an Amplify Science user.
- Note the unit you are teaching.
- Note the type of device you are using (Chromebook, iPad, Windows, laptop).
- Note the web browser you are using (Chrome or Safari).
- Include a screenshot of the problem, if possible. Copy your district or site IT contact on emails.

Amplify Science

