Amplify Science

Grades 6–8

INTEGRATED MODEL

Pilot support

Welcome

Welcome to your Amplify Science pilot!

We're thrilled to welcome you to the Amplify family, and we look forward to making your experience with Amplify Science successful from day one.

The Next Generation Science Standards (NGSS) have raised the bar in science education. What that means for you is having to embrace a new way of teaching—one that shifts the focus of science instruction from students *learning about* to *figuring out*.

Bringing three-dimensional learning to life in the classroom can be challenging. But we're confident that—with Amplify Science by your side—you'll find your transition to the NGSS not only manageable, but also engaging and fun!

We look forward to partnering with you on this journey!

—The Amplify Science Team

Amplify.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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About the program

Amplify Science is a brand-new science curriculum that blends hands-on investigations, literacy-rich activities, and interactive digital tools to empower students to think, read, write, and argue like real scientists and engineers.

In the classroom, this looks like students:

Collecting evidence from a variety of sources

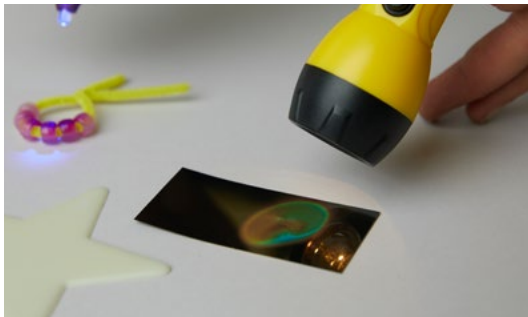
- Hands-on investigations
- Physical models
- Interactive digital simulations
- Scientific texts
- Media (including video clips, photographs, maps, and data sets)

Making sense of evidence in a variety of ways

- Highlighting and annotating texts
- Iteratively revising models
- Weighing the strength of scientific arguments
- Analyzing trends in data sets
- Manipulating variables and recording observations
- Discussing ideas and questions with classmates

Formulating convincing scientific arguments

- Using evidence to support claims
- Constructing and revising models
- Writing sophisticated explanations
- Evaluating the strengths of competing claims

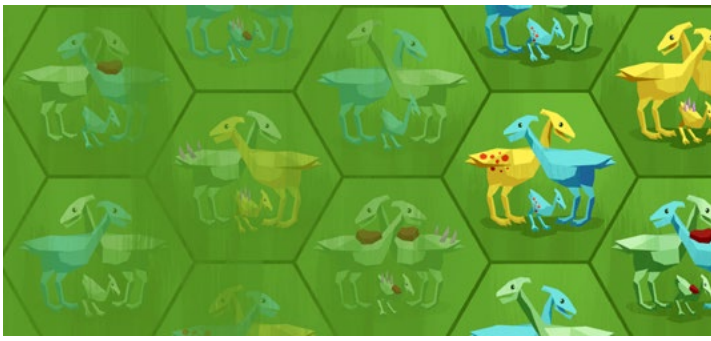


Built for new science standards and three-dimensional learning

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 can rest assured knowing they have access to the newest 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.



Course topics

Grade 6

Microbiome

- **Domain:** Life science
- **Unit type:** Launch
- **Student role:** Microbiological researchers
- **Phenomenon:** How can having 100 trillion microorganisms on and in the human body keep us healthy?

Metabolism

- **Domain:** Life science
- **Unit type:** Core
- **Student role:** Medical researchers
- **Phenomenon:** Why does Elisa feel tired all the time?

Metabolism Engineering Internship

- **Domain:** Life science
- **Unit type:** Engineering internship
- **Student role:** Food engineers
- **Phenomenon:** How can we design health bars that meet the metabolic needs of patients or rescue workers?

Traits and Reproduction

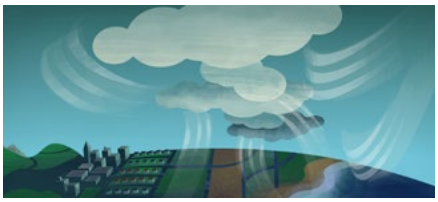
- **Domain:** Life science
- **Unit type:** Core
- **Student role:** Biomedical scientists
- **Phenomenon:** Why do Darwin's bark spider offspring have different silk flexibility traits, even though they have the same parents?

Thermal Energy

- **Domain:** Physical science
- **Unit type:** Core
- **Student role:** Thermal scientists
- **Phenomenon:** Which of two proposed heating systems will best heat Riverdale School?

Ocean, Atmosphere, and Climate

- **Domain:** Earth and space science
- **Unit type:** Core
- **Student role:** Climatologists
- **Phenomenon:** What's causing the air temperature in Christchurch, New Zealand to be cooler than usual during El Niño years?



Weather Patterns

- **Domain:** Earth and space science
- **Unit type:** Core
- **Student role:** Forensic meteorologists
- **Phenomenon:** Why have the storms in Galetown become increasingly severe in recent years?

Earth's Changing Climate

- **Domain:** Earth and space science
- **Unit type:** Core
- **Student role:** Climatologists
- **Phenomenon:** Why is the ice on Earth's surface melting?

Earth's Changing Climate Engineering Internship

- **Domain:** Earth and space science
- **Unit type:** Engineering internship
- **Student role:** Civil engineers
- **Phenomenon:** How can we design rooftops to reduce a city's impact on climate change?

Unit types

While all units are designed to provide three-dimensional learning experiences, each individual unit also emphasizes one of the following science and engineering practices.

Launch units are the first unit taught in each year of Amplify Science California. The goal of the Launch unit is to introduce students to norms, routines, and practices that will be built on throughout the year, including the practices of argumentation, active reading, and using the program's technology. For example, rather than taking the time to explain the process of active reading in every unit in a given year, it is explained thoroughly in the Launch unit, thereby preparing students to do active reading in all subsequent units.

Core units establish the context of the unit by introducing students to a real-world problem. As students move through lessons in a Core unit, they figure out the unit's anchoring phenomena, gain an understanding of the unit's disciplinary core ideas and science and engineering practices, and make linkages across topics through the crosscutting concepts. Each Core unit culminates with a Science Seminar and final writing activity.

Engineering Internship units invite students to design solutions for real-world problems as interns for a fictional company called Futura. Students figure out how to help those in need, from tsunami victims in Sri Lanka to the needs of premature babies, through the application of engineering practices. In the process, they apply and deepen their learning from Core units.

Grade 7

Geology on Mars

- **Domain:** Earth and space science
- **Unit type:** Launch
- **Student role:** Planetary geologists
- **Phenomenon:** How can we search for evidence that other planets were once habitable?

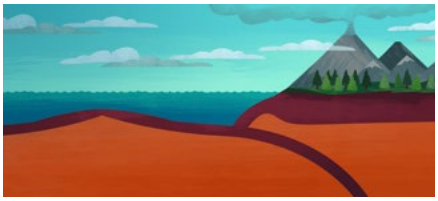


Plate Motion

- **Domain:** Earth and space science
- **Unit type:** Core
- **Student role:** Geologists
- **Phenomenon:** Why have Mesosaurus fossils been found on continents separated by thousands of kilometers of ocean, even though the Mesosaurus species once lived all together?

Plate Motion Engineering Internship

- **Domain:** Earth and space science
- **Unit type:** Engineering internship
- **Student role:** Mechanical engineering interns
- **Phenomenon:** How can we design an effective tsunami warning system?

Rock Transformations

- **Domain:** Earth and space science
- **Unit type:** Core
- **Student role:** Geologists
- **Phenomenon:** Why are rock samples from the Great Plains and from the Rocky Mountains composed of such similar minerals, when they look so different and come from different areas?

Phase Change

- **Domain:** Physical science
- **Unit type:** Core
- **Student role:** Chemists
- **Phenomenon:** What caused the mysterious disappearance of a methane lake on Titan?

Phase Change Engineering Internship

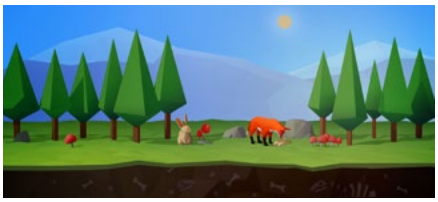
- **Domain:** Physical science
- **Unit type:** Engineering internship
- **Student role:** Chemical engineering interns
- **Phenomenon:** How can we design portable baby incubators that use phase change to keep babies at a healthy temperature?

Chemical Reactions

- **Domain:** Physical science
- **Unit type:** Core
- **Student role:** Forensic chemists
- **Phenomenon:** What is the mysterious brown substance that has been detected in the tap water of Westfield?

Populations and Resources

- **Domain:** Life science
- **Unit type:** Core
- **Student role:** Biologists
- **Phenomenon:** Why has the size of the moon jelly population in Glacier Sea increased?



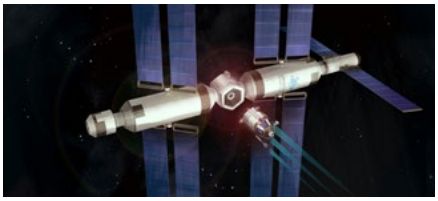
Matter and Energy in Ecosystems

- **Domain:** Life science
- **Unit type:** Core
- **Student role:** Ecologists
- **Phenomenon:** What caused the mysterious crash of a biodome ecosystem?

Grade 8

Harnessing Human Energy

- **Domain:** Physical science
- **Unit type:** Launch
- **Student role:** Energy scientists
- **Phenomenon:** How can rescue workers get energy for their equipment during rescue missions?



Force and Motion

- **Domain:** Physical science
- **Unit type:** Core
- **Student role:** Physicists
- **Phenomenon:** Why did the asteroid-sample-collecting pod fail to dock at the space station as planned?

Force and Motion Engineering Internship

- **Domain:** Physical science
- **Unit type:** Engineering internship
- **Student role:** Mechanical engineering interns
- **Phenomenon:** How can we design delivery pods that are damaged as little as possible when dropped?

Magnetic Fields

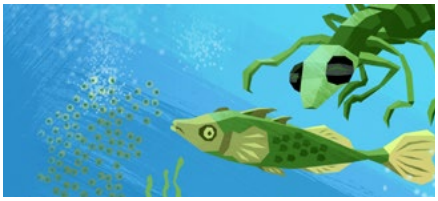
- **Domain:** Physical science
- **Unit type:** Core
- **Student role:** Physicists
- **Phenomenon:** Why didn't the tests of a magnetic spacecraft launcher go as planned?

Light Waves

- **Domain:** Physical science
- **Unit type:** Core
- **Student role:** Spectroscopists
- **Phenomenon:** Why is there a higher rate of skin cancer in Australia than in other parts of the world?

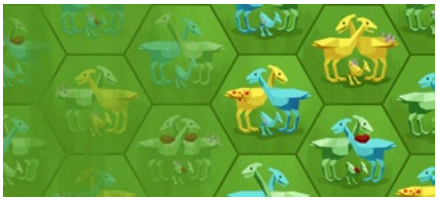
Earth, Moon, and Sun

- **Domain:** Earth and space science
- **Unit type:** Core
- **Student role:** Astronomers
- **Phenomenon:** How can an astrophotographer plan for the best times to take photos of specific features on the moon?



Natural Selection

- **Domain:** Life science
- **Unit type:** Core
- **Student role:** Biologists
- **Phenomenon:** Why has the newt population in Oregon State Park become more poisonous over time?



Natural Selection Engineering Internship

- **Domain:** Life science
- **Unit type:** Engineering internship
- **Student role:** Clinical engineers
- **Phenomenon:** How can we design treatments for malaria that don't lead to drug resistance?

Evolutionary History

- **Domain:** Life science
- **Unit type:** Core
- **Student role:** Paleontologists
- **Phenomenon:** What is the evolutionary history of a Mystery Fossil at the Natural History Museum?

Program structure

Units

11 Lessons
Microbiome

19 Lessons
Metabolism

10 Lessons
Metabolism Engineering Internship

19 Lessons
Traits and Reproduction

Chapters

Chapter 1:
Molecules Needed by the Cells
3 lessons

Chapter 2:
Body Systems
7 lessons

Chapter 3:
Cellular Respiration
5 lessons

Chapter 4:
Metabolism and Athletic Performance
4 lessons

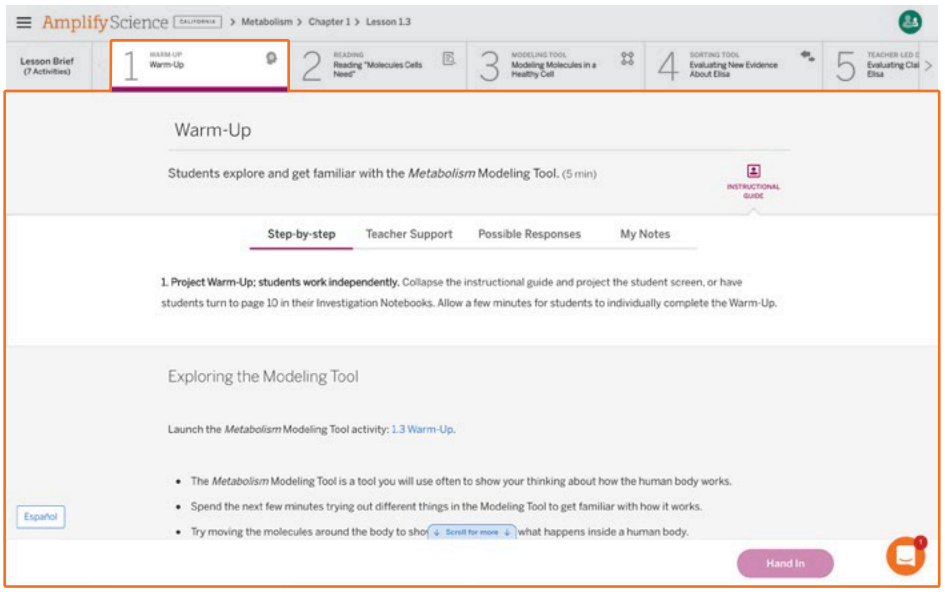
Lessons

Lesson 1.1:
Pre-Unit Assessment

Lesson 1.2:
Welcome to Medical School

Lesson 1.3:
Evaluating Initial Claims About Elisa

Activities

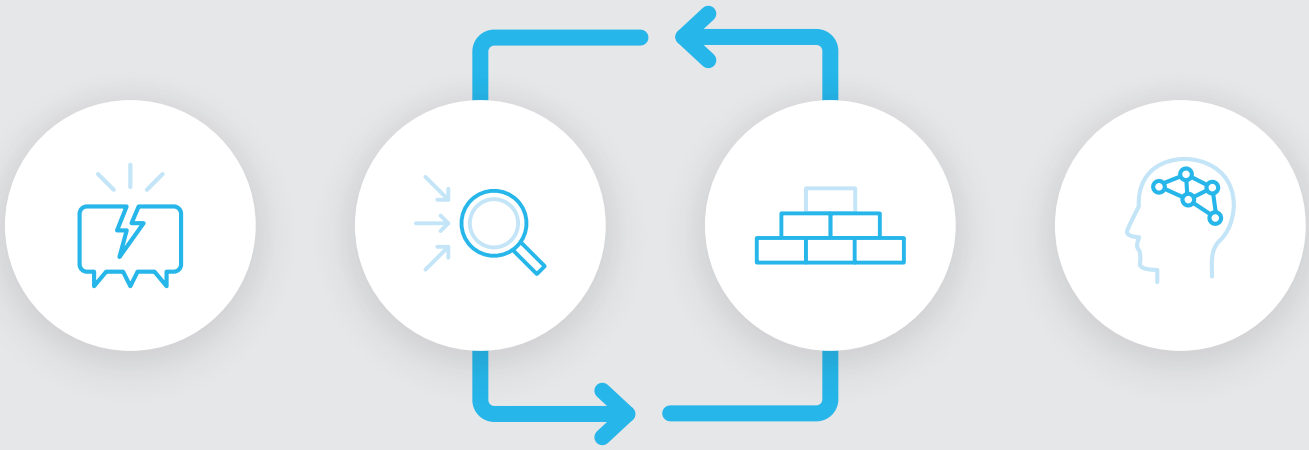


Built to develop meaningful and lasting knowledge

Rather than introducing a concept on Monday, testing for mastery on Friday, and risking students will forget everything by the next Tuesday, we help students build meaningful and lasting knowledge that they can transfer and apply over the course of the entire unit and year. We accomplish this by giving students multiple opportunities (or "at-bats") to encounter and experience a concept. Said another way, Amplify Science is made up of a series of multi-modal "mini-lessons."

It's this iterative and cyclical lesson design that allows students to learn concepts more deeply than in any other program. As they progress through the unit, their understanding gradually builds and deepens, ultimately leading to their ability to develop and refine increasingly complex explanations of the unit's phenomenon.

Lesson design in Amplify Science



Spark intrigue with a real-world problem

Explore evidence from multiple sources

Explain and **elaborate** as understanding deepens

Evaluate claims and apply to a new context or problem

Engage all unit long with cohesive and compelling storylines that build in complexity

Key components

Print Digital

Classroom Slides

Lesson-specific PowerPoints make delivering instruction a snap with embedded links to related resources and suggested teacher talk in the Notes section of each slide. Classroom Slides for grades 6–8 will be available for the 2020–2021 school year!

Teacher's Reference Guide

This unit-specific reference guide includes scientific background knowledge, planning information and resources, color-coded 3-D Statements, and tips for delivering instruction and differentiating learning.

Digital student experience

Students conduct hands-on investigations using digital simulations and modeling tools, engage in active reading and writing activities, participate in discussions, record observations, and craft end-of-unit scientific arguments.

Digital student licenses available

Hardcover Student Edition

Districts looking for a more traditional non-consumable Student Edition can now find it with Amplify Science California! This durable Student Edition is grade-level specific and contains all of the articles that students refer to throughout the year.

Available for purchase as individual copies or a class set

Student Investigation Notebook (2-volume set)

Pair these consumable Student Investigation Notebooks with the hardcover Student Editions and allow students the space to record data, reflect on ideas from texts and investigations, and construct explanations and arguments. This 2-volume set combines activity pages for every unit. Articles are not included.

Available for purchase as individual copies

Student Investigation Notebook with Article Compilation (9-volume set)

Available for every unit, our consumable Student Investigation Notebooks with Article Compilations contain all instructions for activities and space for students to record data, read texts interactively, reflect on ideas from texts and investigations, and construct explanations and arguments.

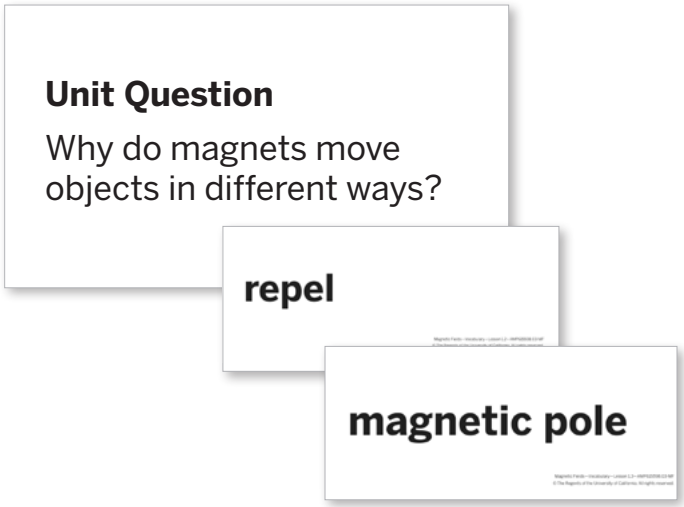
Available for purchase as individual copies

Hands-on materials

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

In the kit you will find:

- Hands-on materials
- Classroom display materials
- One Student Investigation Notebook



Meet your new hands-free TG!

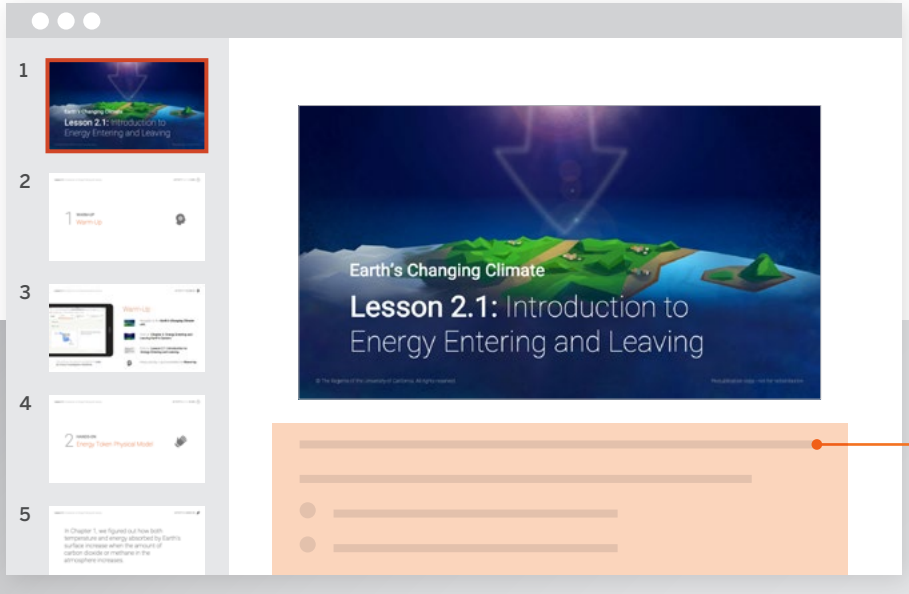
Science time just got a whole lot easier with Classroom Slides! Think of these slides as your hands-free TG. Classroom Slides let you put down the Teacher's Guide and focus on what matters most—your students. Plus, with Classroom Slides, lesson prep is as quick as a click!

Classroom Slides are:

- **Coming soon**, with availability for back to school 2020–2021.
- **Downloadable for offline use**, which means no more sweating unreliable internet connections.
- **Streamlined for easy lesson delivery**, including lesson visuals, activity instructions and transitions, animations, investigation setup videos, technology support, and more.
- **Fully editable**, allowing you to incorporate your own flavor, flair, and favorite resources.

GO ONLINE

To find Classrooms Slides, log into learning.amplify.com and look in the Digital Resources section of any lesson.

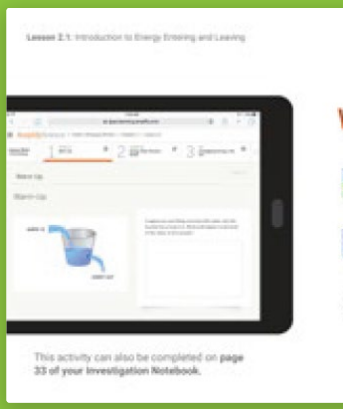


The Notes section of most slides includes suggested teacher talk, teacher actions, potential student responses, and assessment supports. The first slide of each file includes links to relevant resources in the digital Teacher's Guide.

Activity 1

Let's visualize sea turtles using their structures.

How could sea turtles' **structures** help them do what they need to do to **survive**?



Lesson 2.1: Introduction to Energy Entering and Leaving

ACTIVITY 2: HANDS-ON

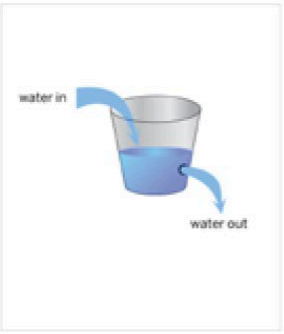
Now, we will focus on answering the Chapter 2 Question.

Chapter 2 Question

Why do temperatures on Earth increase when the amount of carbon dioxide or methane in the Earth system increases?

Lesson 2.1: Introduction to Energy Entering and Leaving

ACTIVITY 2: HANDS-ON



Earlier, you thought about the water level in a bucket as water enters and leaves. This is similar to energy entering and exiting the Earth system.

Activity 3

How did we **communicate** like scientists today?

Lesson 2.1: Introduction to Energy Entering and Leaving

ACTIVITY 2: HANDS-ON

Let's review the new **vocabulary card** posted on the classroom wall.

model

model: an object, diagram, or computer program that helps us understand something by making it simpler or easier to see

Lesson 2.1: Introduction to Energy Entering and Leaving

ACTIVITY 2: HANDS-ON

Energy Token Model: Running the Model

STEP 1

Energy enters: Bring in the correct number of tokens from outer space down through the atmosphere to Earth's surface.

STEP 2

Energy exits: Bring out the correct number of tokens up through the atmosphere to outer space.

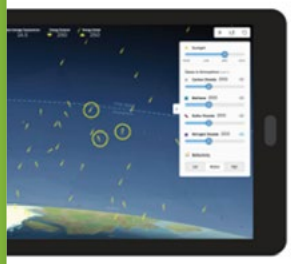
STEP 3

Repeat three times.

Record the final amount of energy at Earth's surface.

Lesson 2.1: Introduction to Energy Entering and Leaving

ACTIVITY 2: HANDS-ON



In the Sim, energy enters and exits the Earth's system.

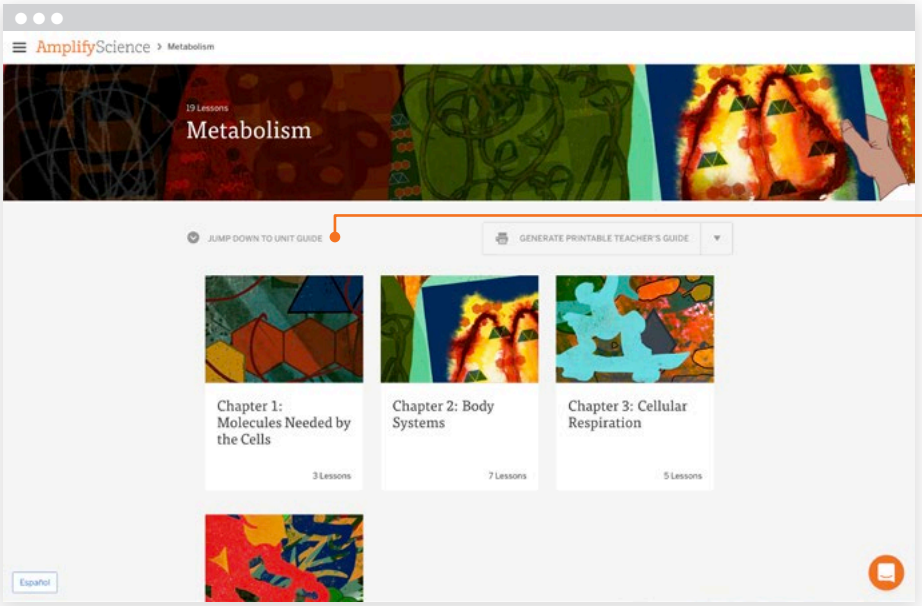
Notice the yellow arrows showing energy entering and exiting.

Navigating a unit

In each Unit Guide section (both in the Teacher's Reference Guide and digital Teacher's Guide) there is a **Planning for the Unit** section that outlines critical information, such as:

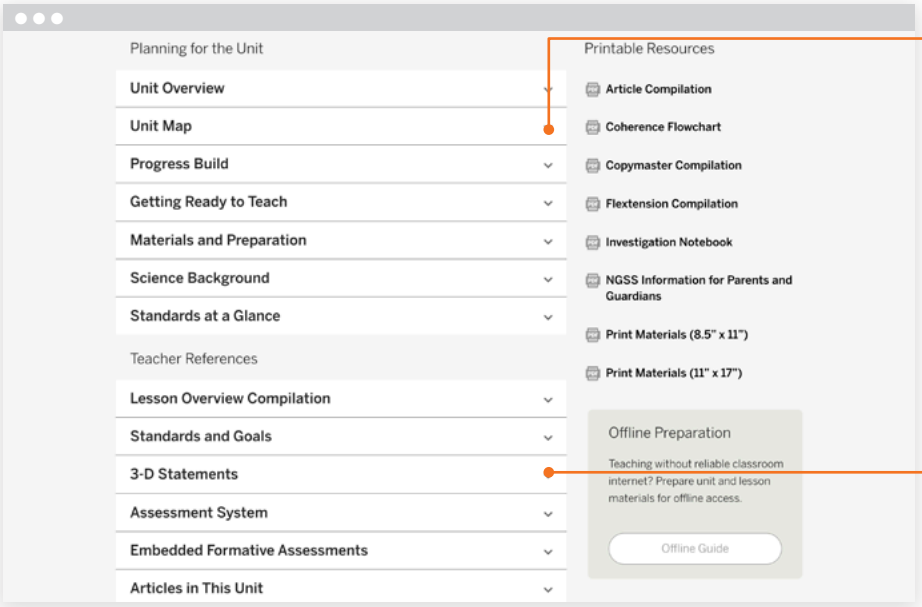
- **Unit Overview** – A detailed explanation of the why behind the unit's content and specific activities
- **Unit Map** – A summary of each chapter including what students figure out and how they do it
- **Progress Build** – The unit's core concept broken down into different levels of understanding to ensure that every child is appropriately challenged
- **Coherence Flowcharts** – A visual tool that represents the storyline of the unit and the coherent flow of questions, evidence, and ideas that support students as they build complex explanations of the unit's anchor phenomenon
- **Materials and Preparation** – A snapshot of the materials you need and how to prep them for instruction
- **Science Background** – Critical information about the science being addressed in the unit

1



Click on **JUMP DOWN TO UNIT GUIDE**.

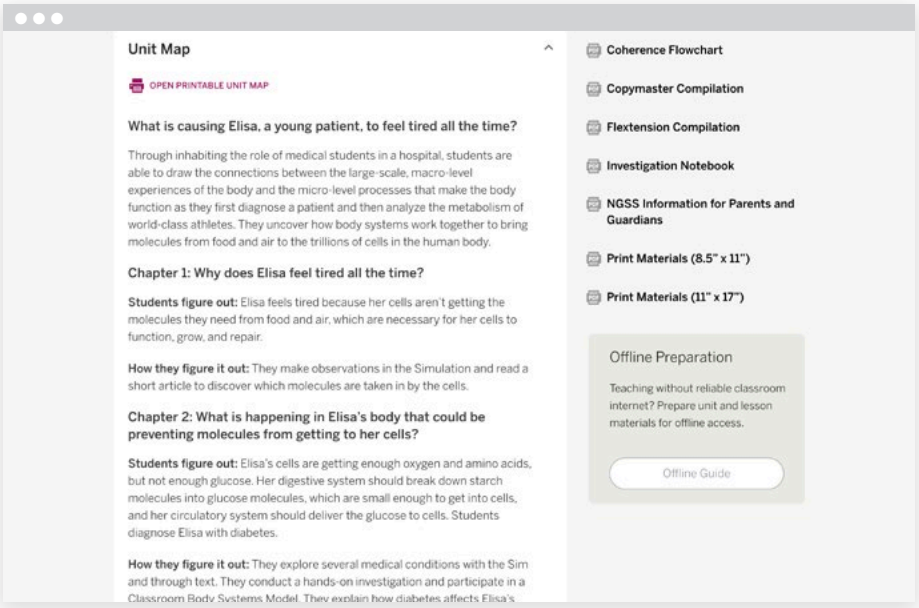
2



To access the **Unit Map**, click on the drop-down arrow.

Review the **3-D Statements** for the unit.

3



Unit Map from the *Metabolism* digital Teacher's Guide

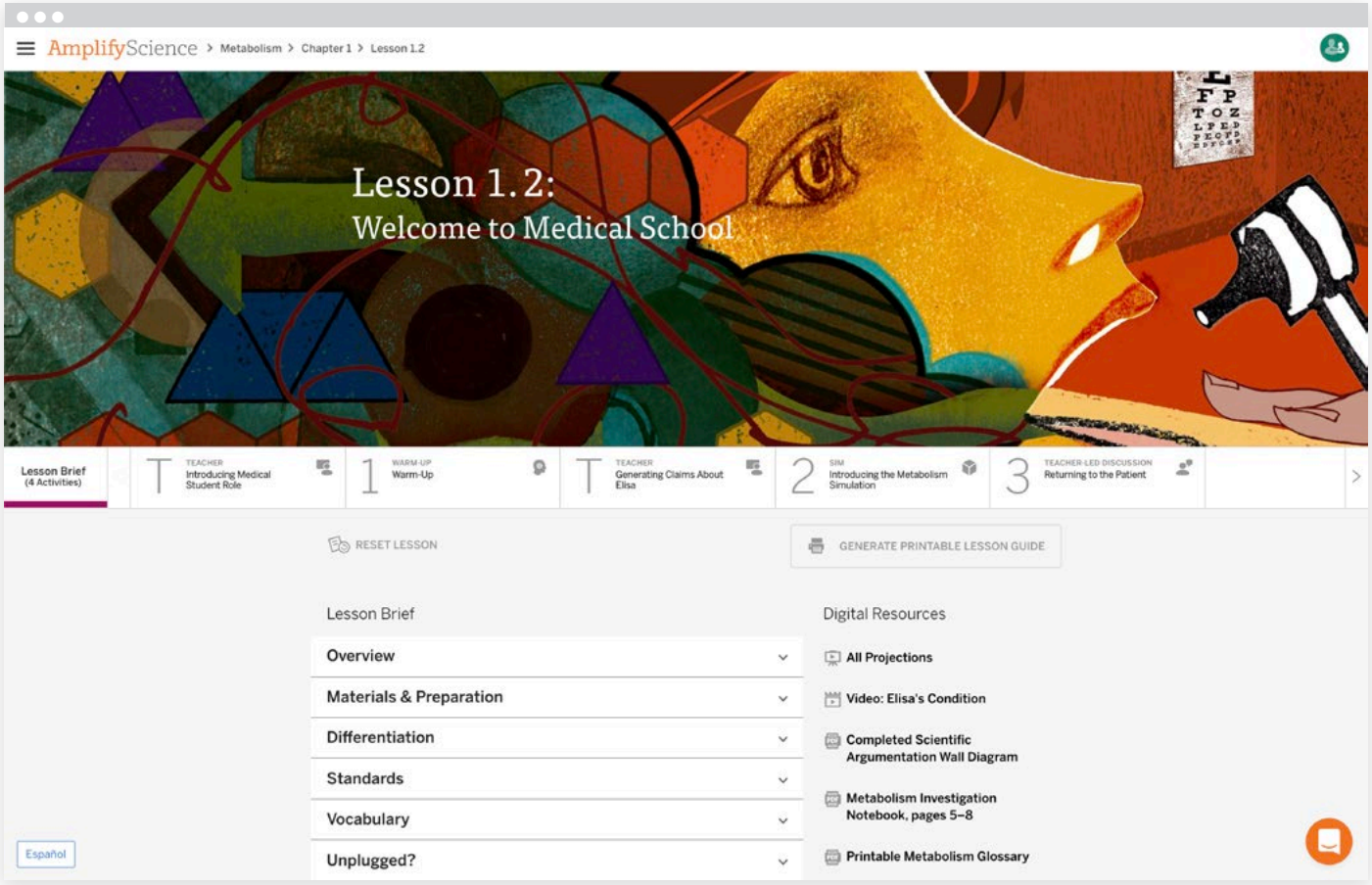
Navigating a lesson

Within each lesson (both in the Teacher's Reference Guide and digital Teacher's Guide) there is a Lesson Brief section that outlines critical information, such as:

- Lesson Overview
- Materials and Preparation
- Differentiation
- Standards
- Vocabulary

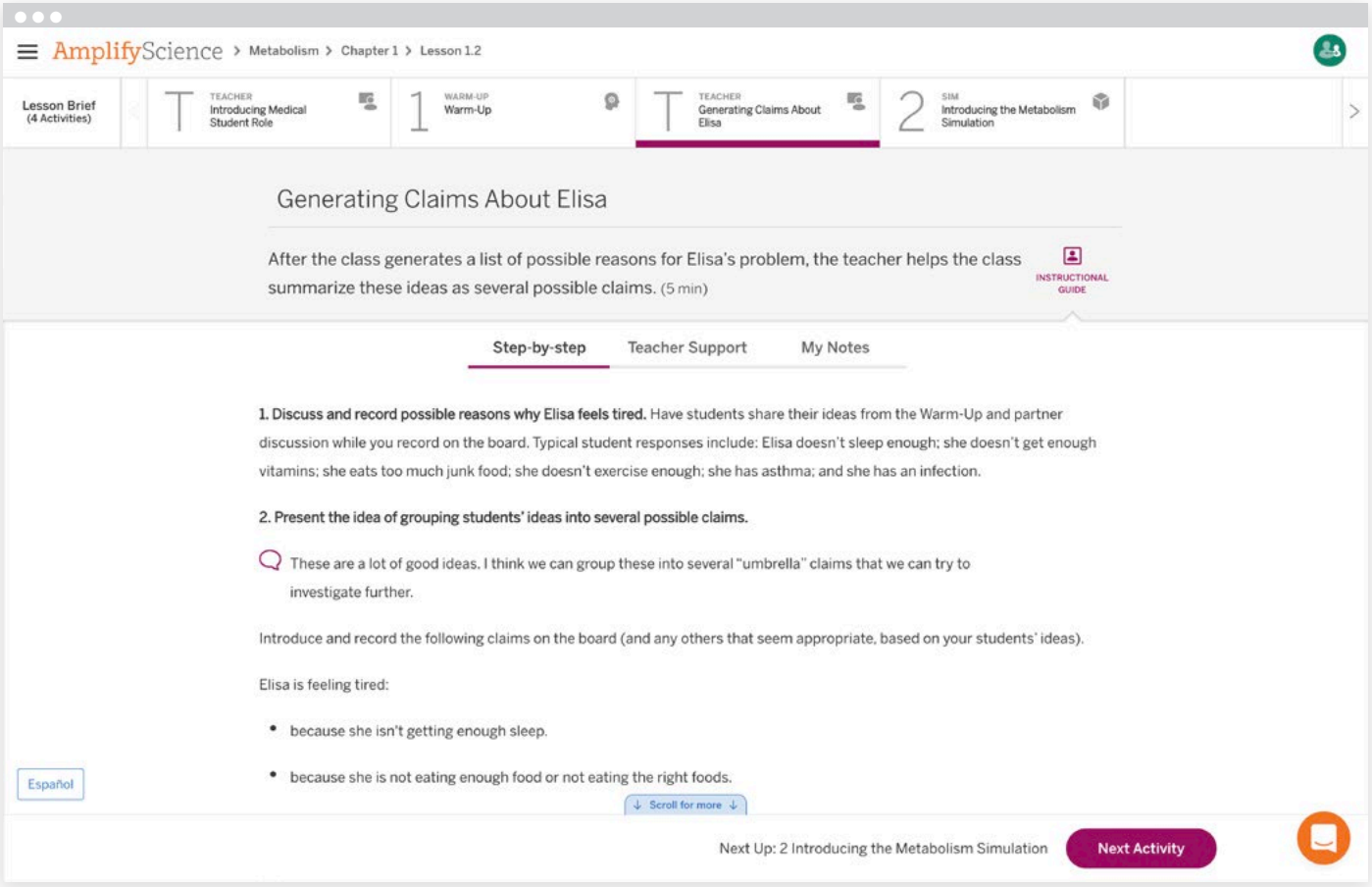
In the digital Teacher's Guide, you'll also find a Digital Resources section that contains key resources, such as:

- Classroom Slides
- Projections
- Video links
- Other lesson-specific resources



Every lesson in Amplify Science is made up of a series of activities. When you navigate to a lesson in the digital Teacher's Guide, you'll see those activities arranged from left to right near the top of your screen. Once you click into an activity, you'll see the Instructional Guide, which includes:

- **Step-by-step instructions for teaching the lesson**
- **Recommended teacher talk**
- **Additional tabs for Teacher Support, Notes, and Possible Student Responses**

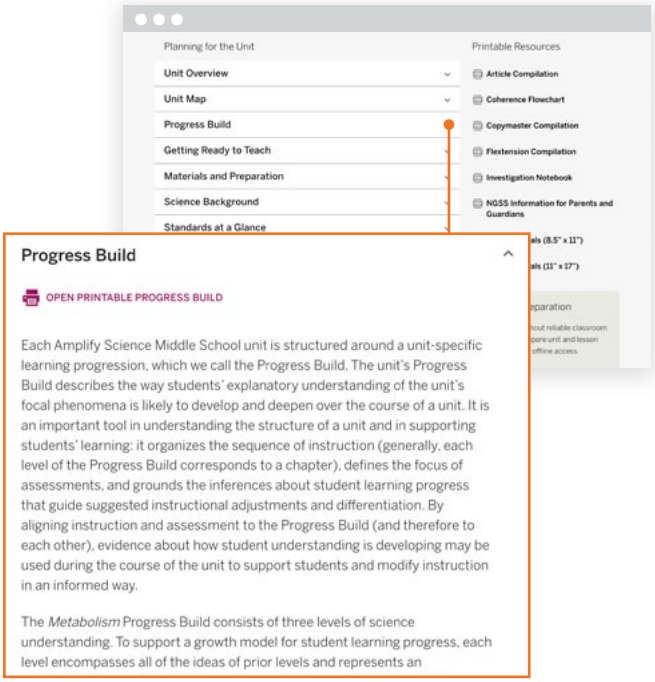


Instructional supports

Progress Builds

Each Progress Build defines several levels of understanding of the unit's anchoring phenomenon, with each level integrating and building upon the knowledge and skills from lower levels. In this way, each Progress Build provides a clear roadmap for how a student's understanding of the phenomenon is expected to deepen and develop with each successive chapter and lesson.

What's more, the program's system of assessments is tied to these Progress Builds. This carefully crafted integration provides teachers with credible, actionable, and timely diagnostic information about student progress. Armed with this powerful data, teachers have the ultimate flexibility to decide when to move on and when to slow down and dive deeper.



Metabolism Progress Build

The Progress Build in this unit consists of three levels of understanding. At each level, students add new ideas and integrate them into a progressively deeper understanding of how body systems work together to provide cells in the human body with the molecules they need.

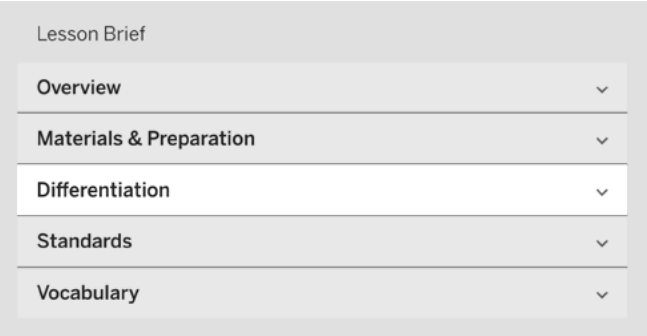
Progress Build Level 1:
Cells in the body need molecules from outside to function.

Progress Build Level 2:
Systems in the body work together to take in, break down, and deliver needed molecules to the cells.

Progress Build Level 3:
Cells can use these molecules to release energy for the body to function.

Differentiation

In addition to unit-specific Progress Builds that break learning goals into smaller, more achievable levels of understanding, Amplify Science makes learning accessible for all students through a variety of scaffolds, supports, and differentiation strategies for every lesson. For a complete list of strategies, see the **Differentiation** section of every Lesson Brief.



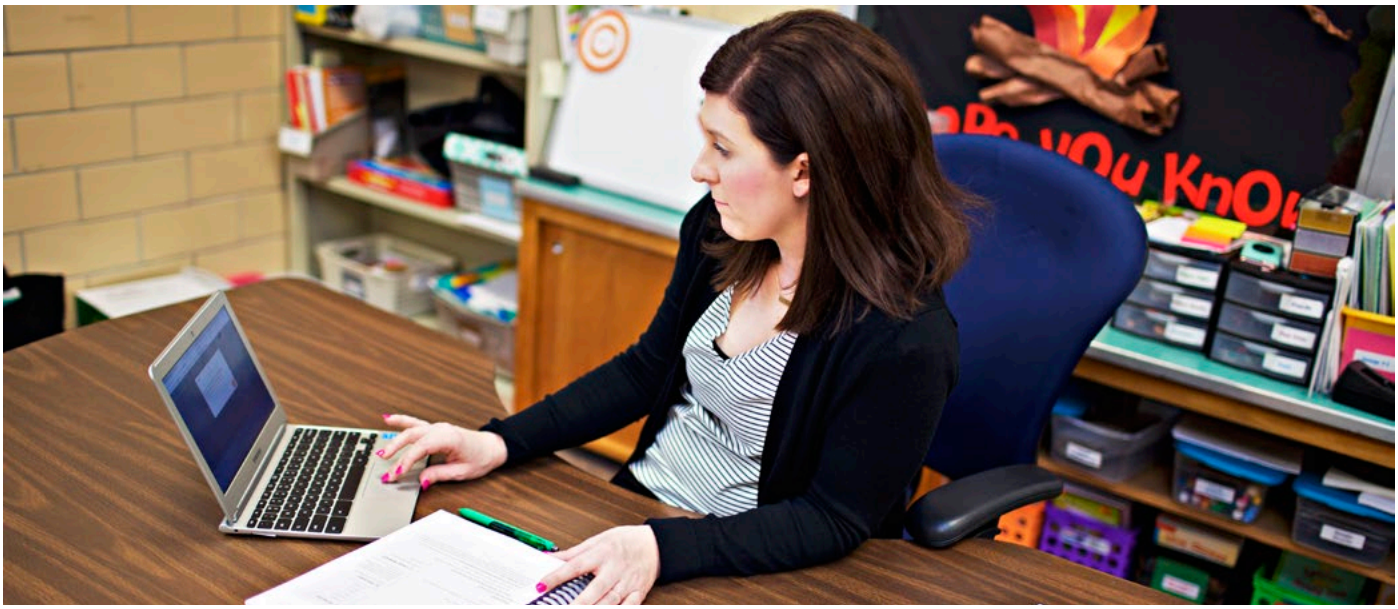
Assessments

In Amplify Science, assessments are directly tied to instruction and support students in advancing through the various levels of the Progress Build.

The assessments included with Amplify Science are:

- **Pre-Unit Assessments:** Conducted during the first lesson of each unit, these assessments include discussion, modeling, and written explanations to gauge students' prior knowledge and inform the instructional pace for the unit.
- **On-the-Fly Assessments (OtFAs):** These multidimensional assessments are integrated regularly throughout the lessons wherever you see this icon . OtFA opportunities provide evidence of how a student is coming to understand core concepts and developing an understanding of SEPs and CCCs.
- **Self-assessments:** Once per chapter, students have an opportunity to reflect on their own learning, ask questions, and reveal ongoing wonderings about unit content.
- **Critical Juncture Assessments:** Each chapter includes an integrated multidimensional performance task that can be use to assess student progress. Examples include writing scientific explanations, engaging in argumentation, developing and using models, and designing engineering solutions.
- **End-of-Unit Assessment:** Assessments toward the end of each unit feature a combination of targeted discussions, student-generated models, and written explanations to gauge students' knowledge and growth.
- **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 three to four times per year, depending on the grade level, and are delivered after specific units in the recommended Amplify Science scope and sequence.

Teaching tips



Tips for preventing tech headaches:

- Download all unit and lesson resources using the Offline Guide in the event that unexpected connectivity issues strike.
- Use Chrome or Safari if possible as these are our preferred browsers.
- Disable pop-up blockers on all devices being used to support lessons.
- Be prepared for some webpages to open in a new tab and for PDF files to download automatically.
- Check and test your connections to any projection devices that you might be using throughout the lesson.
- Display the student URL (**learning.amplify.com**) near the classroom display materials.
- Bookmark frequently used URLs for easy access.

URLS TO BOOKMARK

- **learning.amplify.com** gives you access to the digital Teacher's Guide and also gives your students access to the digital student experience.
- **amplify.com/nat-pilot** gives you access to other pilot support resources including videos, teacher tips, and downloadable unit guides.

Tips for delivering lessons with ease

Know the unit's big idea

Before you begin a unit, become familiar with its big idea, instructional goals, and phenomenon by reading the following sections in the **Unit Guide**:

- Unit Map
- 3-D Statements
- Books in this Unit
- Science Background (if needed)

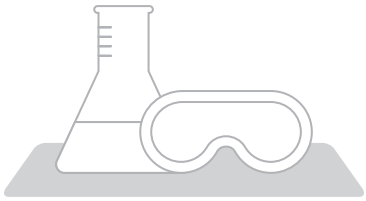
Reading the articles associated with each unit is also a great way to get comfortable with the key concepts that students will encounter over the course of the unit.

Understand how the lesson will flow

Before each lesson, become familiar with the goal of the lesson, its key activities, and your options for addressing various student needs. Start by downloading your **Classroom Slides**, and then read the following sections in the **Lesson Brief**:

- Lesson Overview
- Differentiation
- Vocabulary

Gather your materials



We make finding and managing your materials easy by explaining everything you'll need for each lesson in the **Materials and Preparation** section of the Lesson Brief. This section even organizes your preparation steps as follows:

- Before the Day of the Lesson
- Immediately Before the Lesson
- At the End of the Day

Prepare your digital device plan in advance

What's important to know is that Amplify Science lessons never require that every student has a separate device. When the use of practice apps is called for in a lesson, you have several options:

- **If limited student devices are available**—Have students do the activities in pairs or small groups.
- **If no student devices are available**—Project the digital tool to the class and either "drive" the digital tool yourself or invite students to "drive" by using your device.
- **If internet access is unavailable**—Preload the digital tool on your device or devices for use offline.

Implementation support

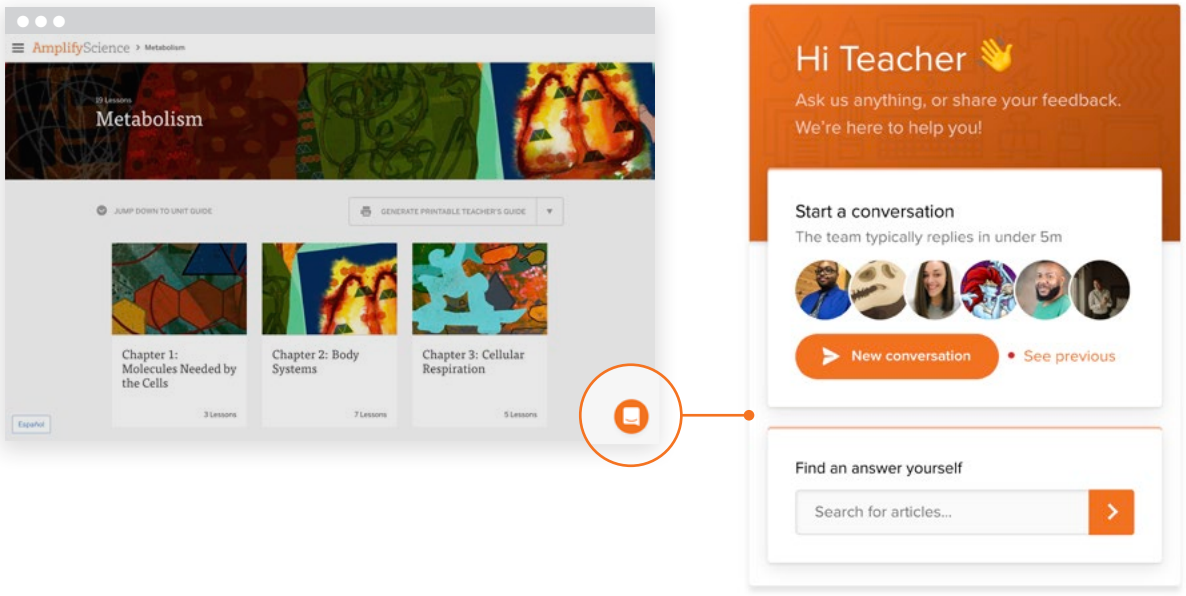
Your role as a pilot teacher is important. Your district is counting on you not only to evaluate how a curriculum works, but also to pick a reliable and supportive long-term partner.

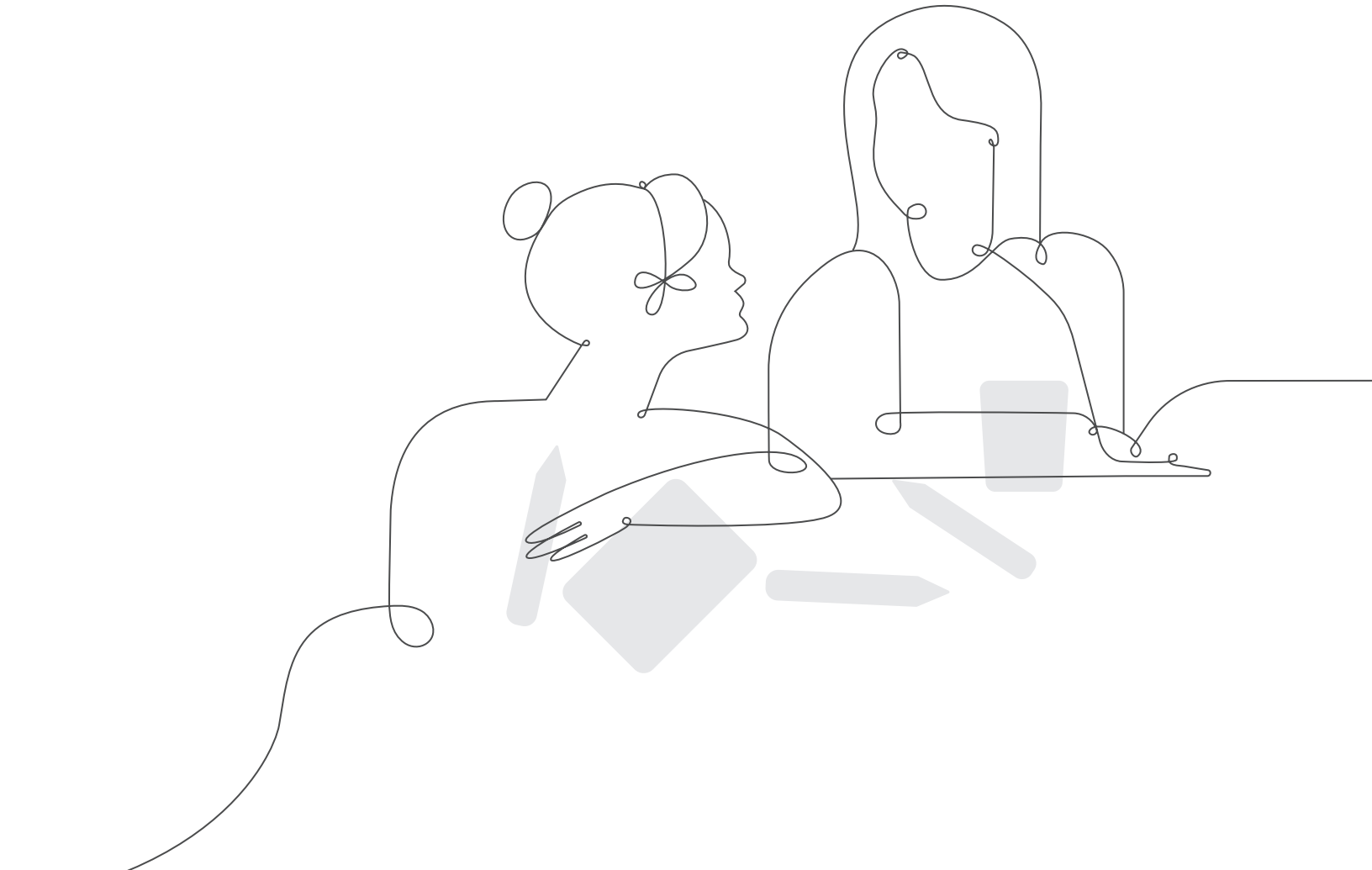
We feel confident that we're that partner, and we look forward to proving that to you during your pilot experience.

Support is available through any of the following channels:

- Chat in real time using the intercom feature in the digital platform.
- Visit **my.amplify.com/help** anytime to browse our library of support posts and on-demand videos.
- Call (800) 823-1969.
- Email **help@amplify.com**.
- Reach out to your pilot coordinator: _____
- Reach out to your Amplify representative: _____

With our intercom, support is just one click away.





For more information on Amplify Science, visit **amplify.com/nat-pilot**.

Amplify.

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