

# Welcome to Amplify Science!

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This site contains supporting resources designed for the Los Angeles Unified School District Amplify Science adoption for grades TK–8.

All LAUSD schools have access to Amplify Science resources at this time.

Click here for [Remote Learning Resources for Amplify Science](#)

[Click here](#) to go back to the LAUSD homepage.

Click the button below to preview the digital Teacher's Guide, and check back for exciting updates to this site!



<https://amplify.com/lausd-science/>

**Do Now:** *The Program Hub has been redesigned! Navigate to the Program Hub and explore the new layout. Can you find the Earth's Features unit?*

# Amplify Science

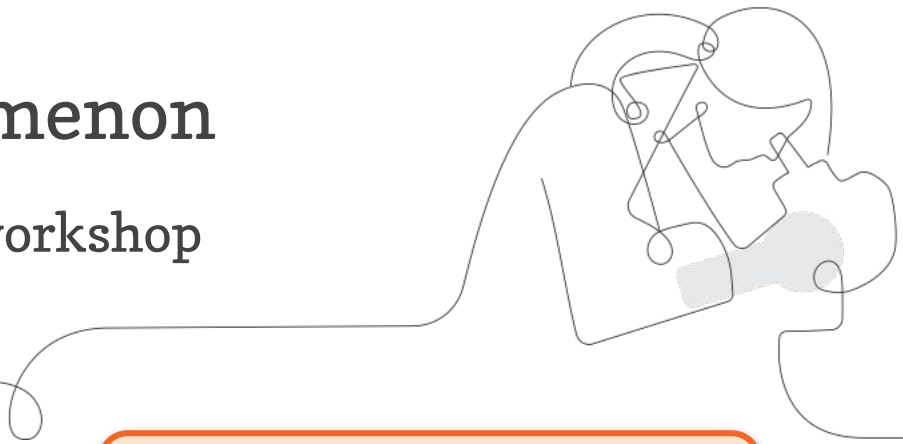
## Earth's Features: Unpacking the phenomenon

Deep-dive and strengthening workshop  
Unit 4 Grade 3

LAUSD

10/x/2020

Presented by Your Name



In a new tab, please log in to  
your Amplify Science account  
through Schoology.

# Norms: Establishing a culture of learners



Please keep your camera on, if possible.  
Take some time to orient yourself to the platform

- *"Where's the chat box? What are these squares at the top of my screen?, where's the mute button?"*



Mute your microphone to reduce background noise unless sharing with the group



The chat box is available for posting questions or responses to during the training



Make sure you have a note-catcher present



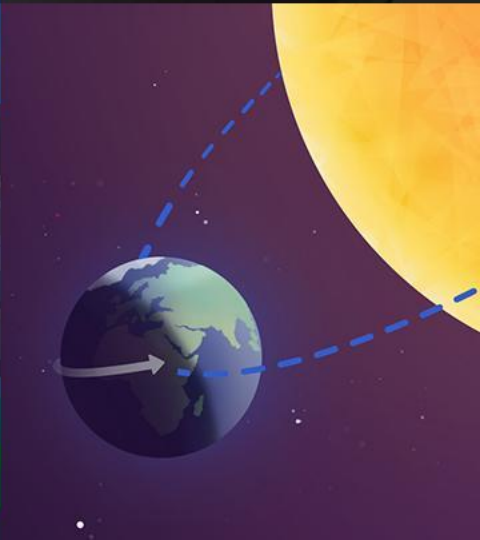
Engage at your comfort level - chat, ask questions, discuss, share!

# Workshop goals

By the end of this workshop, you will be able to:

- Describe how students' conceptual understanding builds through the unit
- Explain how students figure out the phenomenon throughout the unit
- Leverage understanding of the Amplify Science instructional approach to make instructional decisions while teaching remotely



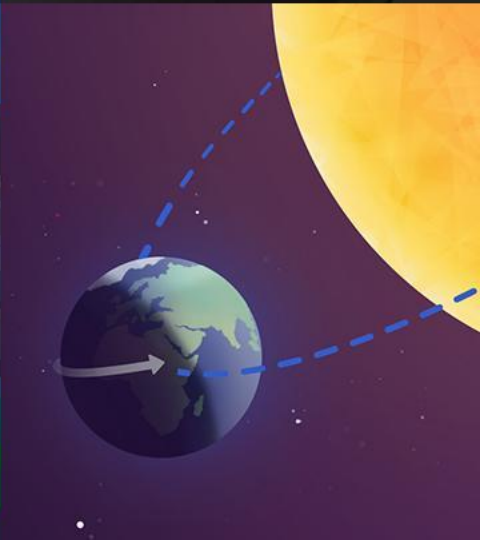


## Plan for the day

- Introduction and framing
- Phenomenon at the unit level
- Program Hub
- Constructing explanations at the chapter level
- Reflection and closing



# Questions?



## Plan for the day

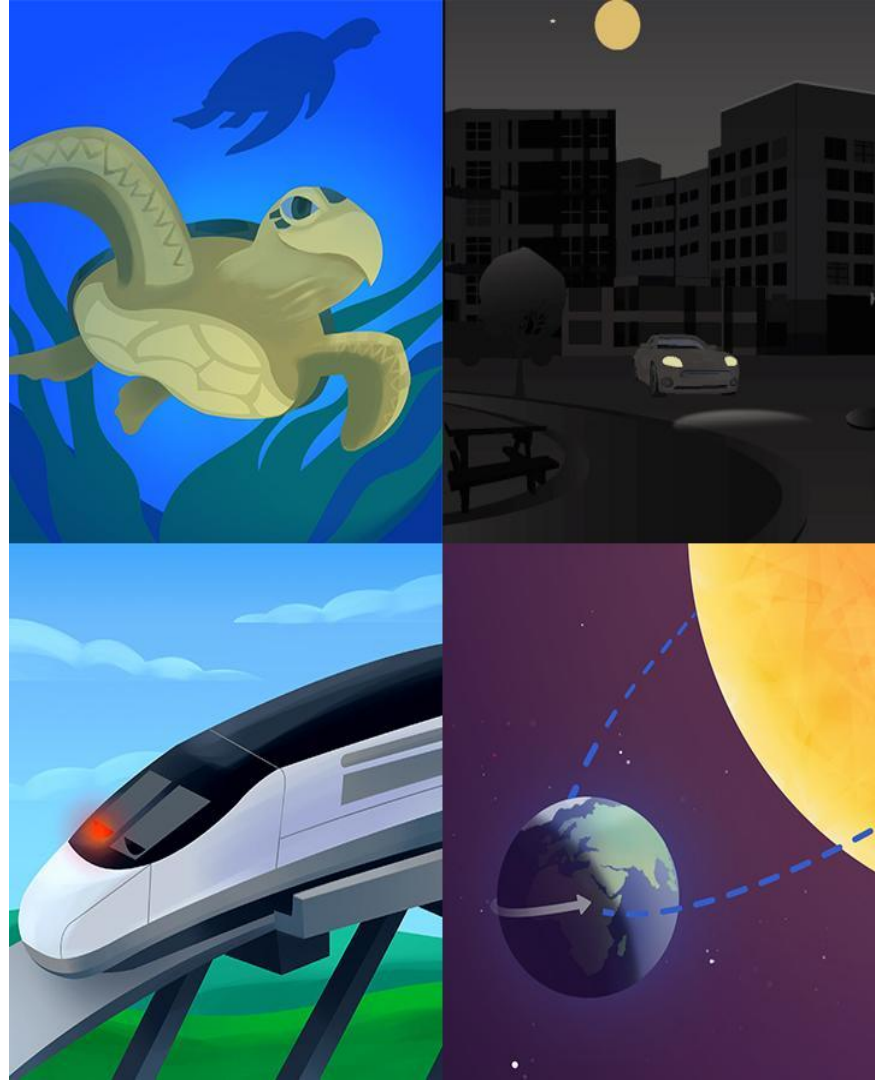
- **Introduction and framing**
- Phenomenon at the unit level
- Program Hub
- Constructing explanations at the chapter level
- Reflection and closing

# Opening reflection

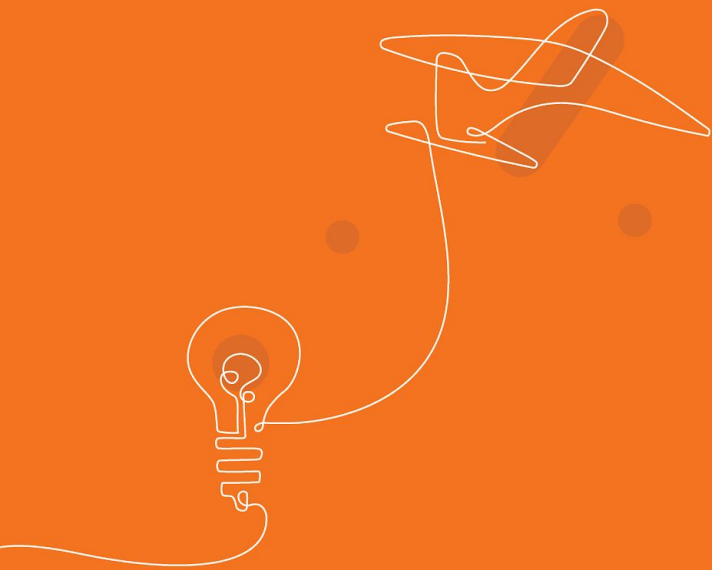
## Jamboard

Having taught with Amplify Science, what stands out to you?

How do students **figure out phenomena** in Amplify Science units?



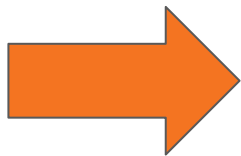
# Key aspects of the Amplify Science instructional approach



# Phenomenon-based instruction

## A shift in science instruction

from learning about  
(like a student)



to figuring out  
(like a scientist)

**Scientific phenomenon:** An observable event  
in the natural world you can use science  
ideas to explain or predict

# Coherent storylines

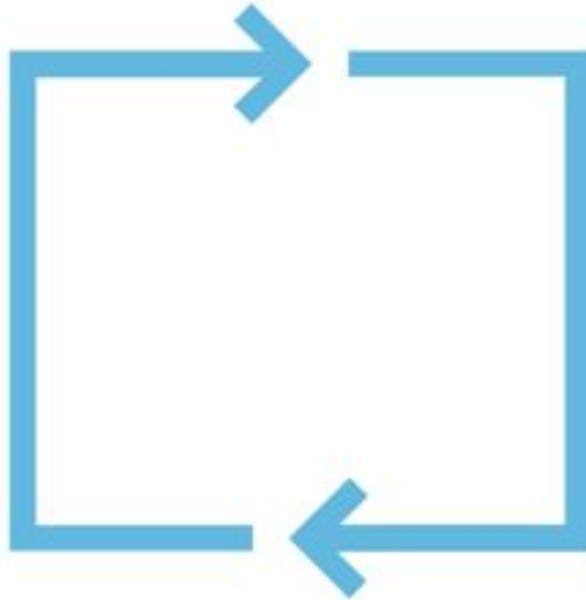
**Chapter 1 Question**  
How did the fossil get  
inside the rocky outcrop?

**Chapter 2 Question**  
What was the environment of Desert  
Rocks National Park like in the past?



# Multimodal learning

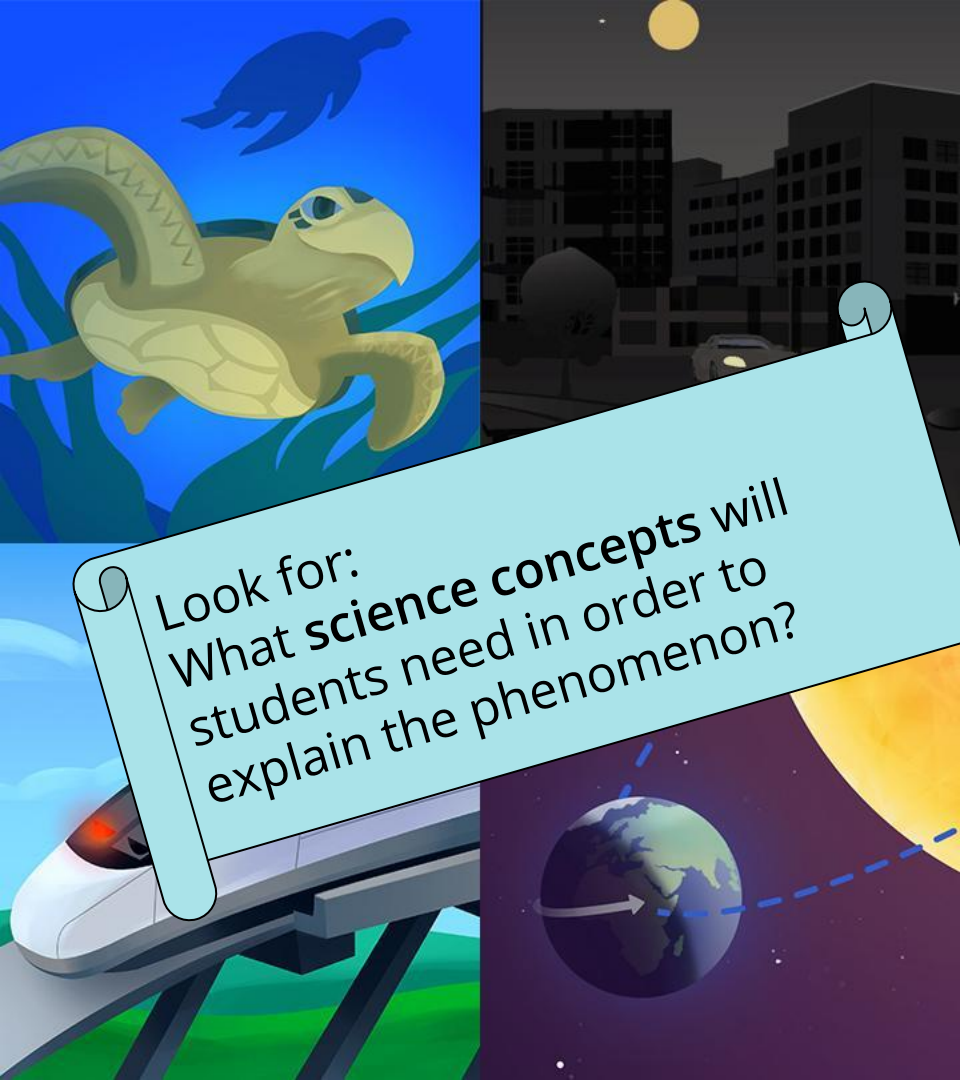
Gathering evidence over multiple lessons



**Do,  
Talk,  
Read,  
Write,  
Visualize**



# Questions?



Look for:  
What **science concepts** will  
students need in order to  
explain the phenomenon?

## Plan for the day

- Introduction and framing
- **Phenomenon at the unit level**
- Program Hub
- Constructing explanations at the chapter level
- Reflection and closing

We're about to begin a new science unit during which we'll learn about how **Earth** can **change** over **long periods of time**.

This is Desert Rocks National Park. We will **investigate** how this place has changed over time.



Desert Rocks National Park is not a real place, but it is **similar to many other parks** in the western United States. Our work will help park visitors understand the history of the park.





This is Desert Rocks Canyon, one of the many canyons in the park. A **canyon** is a **valley with steep sides** made of rock. Something **mysterious was found here** that might help us with our investigations.



1 ?

This is what was found.

Thinking about **what this is** and **how it got there** may give us some clues about what this place was like in the past.



What do you think  
this is?

How do you think it  
got there?



If you thought that was a **fossil**, you're right!

This big section of rock where the fossil was found is called a **rocky outcrop**. A rocky outcrop is a section of exposed rock we can see.



In this unit, we will do what **geologists** do: gather information to think about what a place was like in the past.

Geologists often **study rocks and fossils** to learn what a place was like in the past.



1 ?

We already have our first **two clues**: the **fossil** and the **rocky outcrop** where the fossil was found.

First, we will investigate how the **fossil got into the rocky outcrop**.

**We will work as geologists as we think about what Desert Rocks Canyon was like in the past.**



**geologist**

**a scientist who studies the processes and materials that  
form the solid part of Earth**

Glossary (continued)

**inference:** something you figure out based on observations and what you already know  
**inferencia:** algo que puedes resolver basándote en observaciones y lo que ya conoces  
**model:** something scientists make to answer questions about the real world  
**modelo:** algo que los científicos crean para responder preguntas sobre el mundo real

**observation:** something  
**observación:** algo que nos observamos  
**pattern:** something we observe  
**patrón:** algo que observamos  
**rock layer:** a thick sheet  
**capa de roca:** una lámina gruesa  
**sediment:** small pieces of rock  
**sedimento:** piezas pequeñas de roca  
**sedimentary rock:** a type of rock that forms from sediments over time  
**roca sedimentaria:** un tipo de roca que se forma con el tiempo a partir de sedimentos  
**stable:** staying mostly the same  
**estable:** que permanece igual

Glossary

**argument:** the use of evidence to say why one idea is the best  
**argumento:** el uso de evidencia para decir por qué una idea es la mejor  
**cement:** to stick together in the process of forming rock  
**cementar:** pegarse en el proceso de formar roca  
**claim:** a proposed answer to a question  
**afirmación:** una respuesta propuesta para una pregunta  
**compact:** to press together  
**compactar:** comprimir  
**data:** observations or measurements recorded in an investigation  
**datos:** observaciones o mediciones apuntadas en una investigación  
**environment:** all the living and nonliving things in an area  
**ambiente:** todo (viviendo y no vivo) lo que hay en un área  
**erosion:** when rock, soil, or sand is worn down and moved from one place to another by water, wind, or ice  
**erosión:** cuando la roca, el suelo o la arena son desgastados y movidos de un lugar a otro por el agua, el viento o el hielo  
**evidence:** information that supports an answer to a question  
**evidencia:** información que respalda una respuesta a una pregunta  
**fossil:** a clue about life from the past that is preserved in rock  
**fósil:** una pista acerca de la vida del pasado que se preserva en la roca  
**geologist:** a scientist who studies the processes and materials that form the solid part of Earth  
**geólogo/a:** un/a científico/a que estudia los procesos y materiales que forman la parte sólida de la Tierra

You have a **Glossary** you can use if you need to find definitions for science words we are using.

Throughout the unit, we will work to answer this question:

## **Unit Question**

**How do rocks and fossils tell us about the way Earth changes over time?**

# Explaining the phenomenon: science concepts

Please respond in the chat

What **science concepts** do you think students need to understanding in order to construct an explanation about the fossil in Desert Rocks Canyon?



# Unit Guide Resources

Planning for the Unit

Unit Overview

Unit Map

Progress Build

Getting Ready to Teach

Materials and Preparation

Science Background

Standards at a Glance

Teacher References

Lesson Overview Compilation

Standards and Goals

3-D Statements

Assessment System

Embedded Formative Assessments

Articles in This Unit

Apps in This Unit

Flextensions in This Unit

Printable Resources

Article Compilation

Coherence Flowchart

Copymaster Compilation

Flextension Compilation

Investigation Notebook

NGSS Information for Parents and Guardians

Print Materials (8.5" x 11")

Print Materials (11" x 17")

Offline Preparation

Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.

Offline Guide

## Unit Guide resources

Once a unit is selected, select **JUMP DOWN TO UNIT GUIDE** in order to access all unit-level resources in an Amplify Science unit.

### Planning for the unit

Unit Overview	Describes what's in each unit, the rationale, and how students learn across chapters
Unit Map	Provides an overview of what students figure out in each chapter, and how they figure it out
Progress Build	Explains the learning progression of ideas students figure out in the unit
Getting Ready to Teach	Provides tips for effectively preparing to teach and teaching the unit in your classroom
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
Standards at a Glance	Lists Next Generation Science Standards (NGSS) (Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts), Common Core State Standards for English Language Arts, and Common Core State Standards for Mathematics

### Teacher references

Lesson Overview Compilation	Lesson Overview of each lesson in the unit, including lesson summary, activity purposes, and timing
Standards and Goals	Lists NGSS (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts) and CCSS (English Language Arts and Mathematics) in the unit, explains how the standards are reached
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, identifies each 3-D assessment opportunity in the unit
Embedded Formative Assessments	Includes full text of formative assessments in the unit
Books in This Unit	Summarizes each unit text and explains how the text supports instruction
Apps in This Unit	Outlines functionality of digital tools and how students use them (in grades 2-5)

### Printable resources

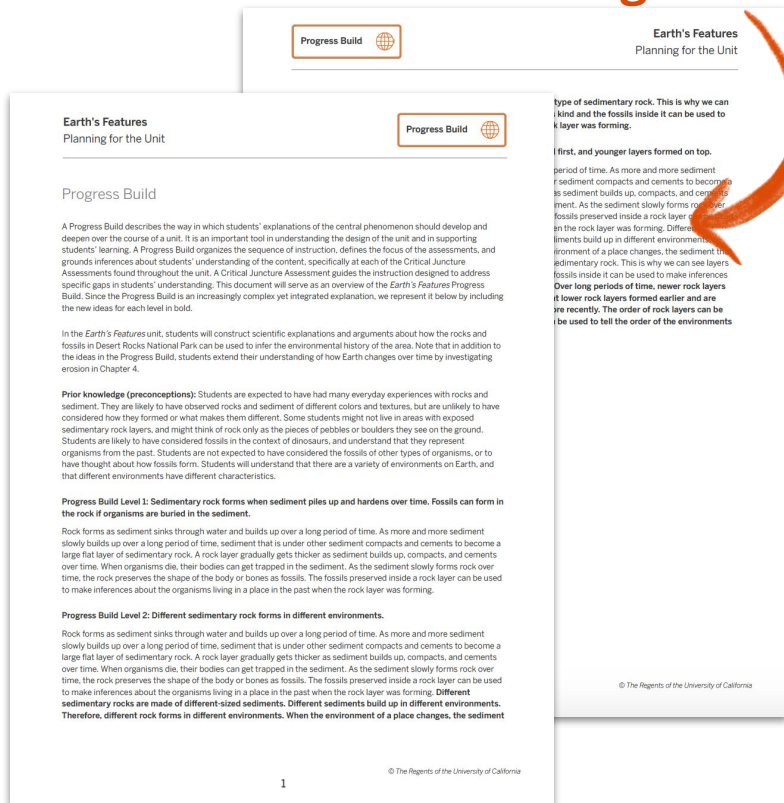
Copymaster Compilation	Compilation of all copymasters for the teacher to print and copy throughout the unit
Investigation Notebook	Digital version of the Investigation Notebook, for copying and projecting
Multi-Language Glossary	Glossary of unit vocabulary in multiple languages
Print Materials (8.5" x 11")	Digital compilation of printed cards (i.e. vocabulary cards, student card sets) provided in the kit
Print Materials (11" x 17")	Digital compilation of printed Unit Question, Chapter Questions, and Key Concepts provided in the kit



# Explaining the phenomenon: science concepts

Pages 2-3

Read the Progress Build.  
Make notes about the  
science ideas students  
figure out, and how the  
ideas at different levels  
connect to one another.



**Progress Build**

**Earth's Features**  
Planning for the Unit

**Progress Build**

A Progress Build describes the way in which students' explanations of the central phenomenon should develop and deepen over the course of a unit. It is an important tool in understanding the design of the unit and in supporting students' learning. A Progress Build organizes the sequence of instruction, defines the focus of the assessments, and grounds inferences about students' understanding of the content, specifically at each of the Critical Juncture Assessments found throughout the unit. A Critical Juncture Assessment guides the instruction designed to address specific gaps in students' understanding. This document will serve as an overview of the Earth's Features Progress Build. Since the Progress Build is an increasingly complex yet integrated explanation, we represent it below by including the new ideas for each level in bold.

In the Earth's Features unit, students will construct scientific explanations and arguments about how the rocks and fossils in Desert Rocks National Park can be used to infer the environmental history of the area. Note that in addition to the ideas in the Progress Build, students extend their understanding of how Earth changes over time by investigating erosion in Chapter 4.

**Prior knowledge (preconceptions):** Students are expected to have had many everyday experiences with rocks and sediment. They are likely to have observed rocks and sediment of different colors and textures, but are unlikely to have considered how they formed or what makes them different. Some students might not live in areas with exposed sedimentary rock layers, and might think of rock only as the pieces of pebbles or boulders they see on the ground. Students are likely to have considered fossils in the context of dinosaurs, and understand that they represent organisms from the past. Students are not expected to have considered the fossils of other types of organisms, or to have thought about how fossils form. Students will understand that there are a variety of environments on Earth, and that different environments have different characteristics.

**Progress Build Level 1: Sedimentary rock forms when sediment piles up and hardens over time. Fossils can form in the rock if organisms are buried in the sediment.**

Rock forms as sediment sinks through water and builds up over a long period of time. As more and more sediment slowly builds up over a long period of time, sediment that is under other sediment compacts and cements to become a large flat layer of sedimentary rock. A rock layer gradually gets thicker as sediment builds up, compacts, and cements over time. When organisms die, their bodies can get trapped in the sediment. As the sediment slowly forms rock over time, the rock preserves the shape of the body or bones as fossils. The fossils preserved inside a rock layer can be used to make inferences about the organisms living in a place in the past when the rock layer was forming.

**Progress Build Level 2: Different sedimentary rock forms in different environments.**

Rock forms as sediment sinks through water and builds up over a long period of time. As more and more sediment slowly builds up over a long period of time, sediment that is under other sediment compacts and cements to become a large flat layer of sedimentary rock. A rock layer gradually gets thicker as sediment builds up, compacts, and cements over time. When organisms die, their bodies can get trapped in the sediment. As the sediment slowly forms rock over time, the rock preserves the shape of the body or bones as fossils. The fossils preserved inside a rock layer can be used to make inferences about the organisms living in a place in the past when the rock layer was forming. **Different sedimentary rocks are made of different-sized sediments. Different sediments build up in different environments. Therefore, different rock forms in different environments. When the environment of a place changes, the sediment**

**Earth's Features**  
Planning for the Unit

**Progress Build**

type of sedimentary rock. This is why we can kind and the fossils inside it can be used to layer was forming.

**first, and younger layers formed on top.**

period of time. As more and more sediment sediment compacts and cements to become as sediment builds up, compacts, and cement. As the sediment slowly forms rock, fossils preserved inside a rock layer in the rock layer was forming. Different sediments build up in different environments. environment of a place changes, the sediment of sedimentary rock. This is why we can see layers fossils inside it can be used to make inferences **Over long periods of time, newer rock layers it lower rock layers formed earlier and are are recently. The order of rock layers can be be used to tell the order of the environments**

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1

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# Progress Build



**Level 3:** The lowest layer of sedimentary rock formed first, and younger layers formed on top.

**Level 2:** Different sedimentary rock forms in different environments.

**Level 1:** Sedimentary rock forms when sediment piles up and hardens over time. Fossils can form in the rock if organisms are buried in the sediment.

# Additional science concept resources for teachers

**Science Background:**  
Adult-level summary of unit  
science concepts

**Standards and Goals:**  
Information about NGSS  
standards and how they're  
achieved in the unit

The screenshot displays a user interface for a science teacher resource platform. It is organized into three main columns. The left column contains a list of resource categories, each with a dropdown arrow. The middle column lists specific resources under these categories. The right column contains a list of printable resources and an offline preparation section.

Planning for the Unit	Printable Resources
Unit Overview	Article Compilation
Unit Map	Coherence Flowchart
Progress Build	Copymaster Compilation
Getting Ready to Teach	Flexension Compilation
Materials and Preparation	Investigation Notebook
Science Background	NGSS Information for Parents and Guardians
Standards at a Glance	Print Materials (8.5" x 11")
	Print Materials (11" x 17")
Teacher References	Offline Preparation
Lesson Overview Compilation	Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.
Standards and Goals	Offline Guide
3-D Statements	
Assessment System	
Embedded Formative Assessments	
Articles in This Unit	
Apps in This Unit	
Flexensions in This Unit	

# Applying conceptual understanding to explain the phenomenon



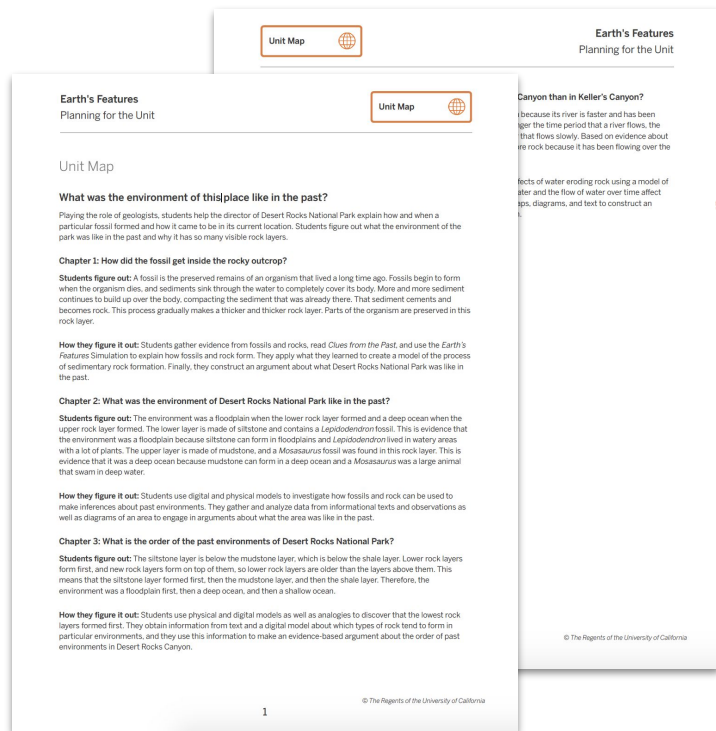
1?

# Explaining the phenomenon: chapter by chapter

Pages 4-5

Read the Unit Map. As you read, think about the science concepts you read about in the Progress Build.

What conceptual understandings are reflected in each chapter's explanation?



## Applying conceptual understanding to explain the phenomenon

Use ideas from the Progress Build and Unit Map to make notes about the conceptual and explanatory builds in your unit.

	Science concepts	Explanation of the phenomenon
	<i>Students figure out...</i>	<i>So they can explain...</i>
Chapter 1	Fossils form when an organism dies and its body is covered by sediment. Over time more sediment builds up and compacts. Eventually, it cements and becomes rock, and the rock layer becomes thicker over time.	The park used to be under water. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More sediment built up, compacted, and was cemented into a rock layer.
Chapter 2		

### Chapter 1: How did the fossil get inside the rocky outcrop?

**Students figure out:** A fossil is the preserved remains of an organism that lived a long time ago. Fossils begin to form when the organism dies, and sediments sink through the water to completely cover its body. More and more sediment continues to build up over the body, compacting the sediment that was already there. That sediment cements and becomes rock. This process gradually makes a thicker and thicker rock layer. Parts of the organism are preserved in this rock layer.

**How they figure it out:** Students gather evidence from fossils and rocks, read *Clues from the Past*, and use the *Earth's Features* Simulation to explain how fossils and rock form. They apply what they learned to create a model of the process of sedimentary rock formation. Finally, they construct an argument about what Desert Rocks National Park was like in the past.

# Breakout groups

Discuss the science concepts and explanations for the remaining chapters and complete the graphic organizer.

Remember, your Explanation of the phenomenon column should refer to the fossil in the park!

Page 6

## Applying conceptual understanding to explain the phenomenon

Use ideas from the Progress Build and Unit Map to make notes about the conceptual and explanatory builds in your unit.

	Science concepts	Explanation of the phenomenon
	<i>Students figure out...</i>	<i>So they can explain...</i>
Chapter 1	Fossils form when an organism dies and its body is covered by sediment. Over time more sediment builds up and compacts. Eventually, it cements and becomes rock, and the rock layer becomes thicker over time.	The park used to be under water. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More sediment built up, compacted, and was cemented into a rock layer.
Chapter 2		
Chapter 3		
Chapter 4		

# Share your thinking

## Please respond in the chat

Based on your work in small groups, what are your ideas about how **students' explanations become more complete and complex** throughout the unit?

### Applying conceptual understanding to explain the phenomenon

Use ideas from the Progress Build and Unit Map to make notes about the conceptual and explanatory builds in your unit.

	Science concepts	Explanation of the phenomenon
	<i>Students figure out...</i>	<i>So they can explain...</i>
Chapter 1		
Chapter 2		
Chapter 3		
Chapter 4		

# Earth's Features unit storyline

## Look for

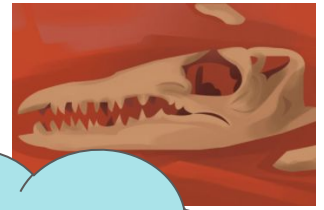
As you listen to the storyline summary, **consider the connections between chapters.**

How do the **ideas flow logically** from one chapter to the next?



# Earth's Features

## Chapter 1



**Chapter Question:** How did the rocky o

After figuring out this explanation, what might students wonder next?

**Explanation:** The park used to be under water. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More sediment built up, compacted, and was cemented into a rock layer.

# Earth's Features

## Chapter 2



**Chapter Question:** What was the environment of Desert Rocks National Park like in the past?



**Explanation:** The environment at Desert Rocks National Park was a floodplain when the lower rock layer (siltstone) was formed and a deep ocean when the upper rock layer (mudstone) was formed.

# Earth's Features

## Chapter 3



**Chapter Question:** What is the order of the past environments in Desert Rock National Park?



**Explanation:** Lower rock layers are older than the layers above them. The siltstone layer formed first and then the mudstone layer and then the shale layer. This means that the environment was a floodplain first, then was a deep ocean, and then a shallow ocean.

# Earth's Features

## Chapter 4



**Chapter Question:** Why did more rock layers get exposed in Desert Canyon than Keller's Canyon?

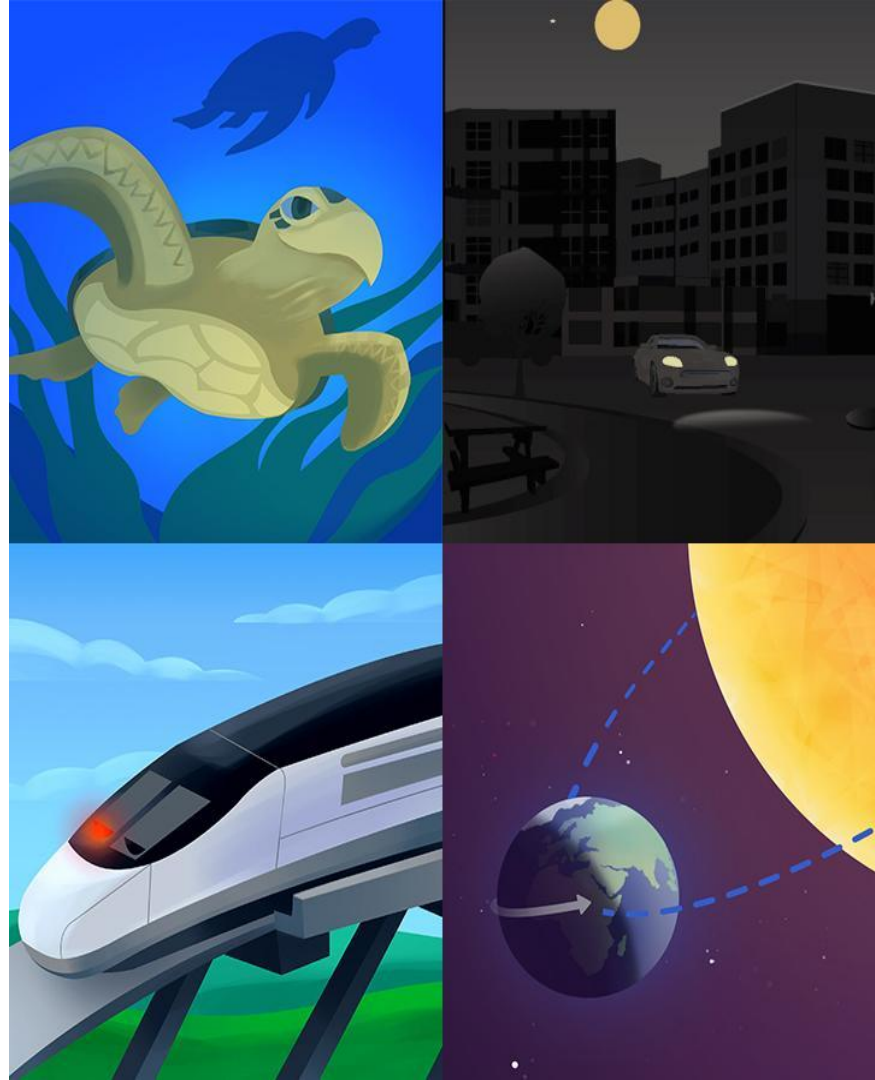


**Explanation:** More rock layers got exposed in Desert Rocks Canyon because the river that flows in Desert Rocks Canyon is faster and has been there longer than the river in Keller's Canyon.

# Reflection

## Jamboard

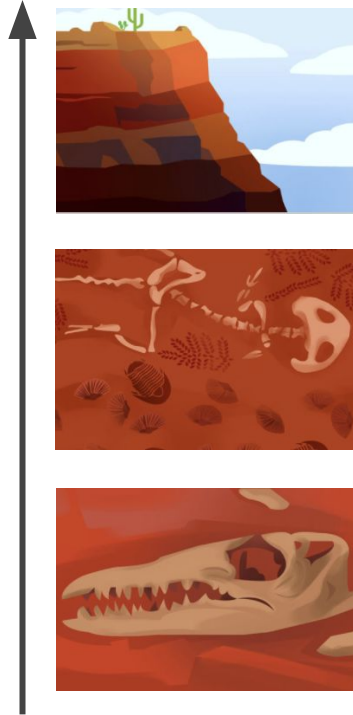
How will understanding the unit's **storyline** help you during **remote instruction**?



# Key Takeaway

## Conceptual build and explanatory build

Throughout the unit, students' conceptual understanding grows deeper, allowing their explanations of the phenomenon to become more complete and complex.



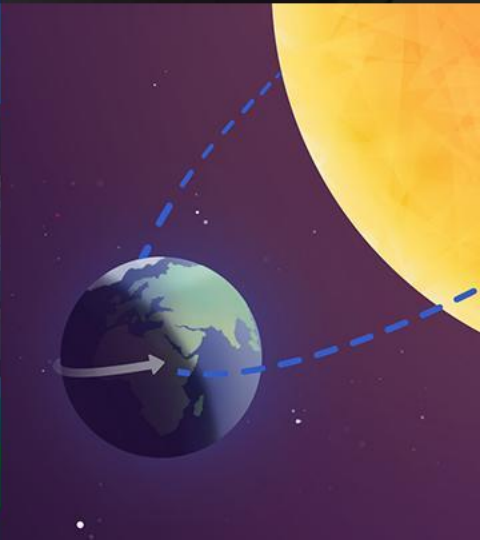
**Level 3:** The lowest layer of sedimentary rock formed first, and younger layers formed on top.

**Level 2:** Different sedimentary rock forms in different environments.

**Level 1:** Sedimentary rock forms when sediment piles up and hardens over time. Fossils can form in the rock if organisms are buried in the sediment.



# Questions?



## Plan for the day

- Introduction and framing
- Phenomenon at the unit level
- **Program Hub**
- Constructing explanations at the chapter level
- Reflection and closing

# Accessing the Program Hub

Page 7

**AmplifyScience**

Hello Teacher Considine  
t.considine@tryamplify.net

Log Out

Go To My Account ⚙️

Classroom Language Settings

LA Science Program Guide

Program Hub

Science Program Guide

FLORIDA EDITION

Standards Map

Help

6th Grade ▾

11 Lessons  
**Microbiome**

19 Lessons  
**Metabolism**

FUTURA  
FOOD ENGINEERING

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<https://www.amplify.com/floridastandards>

## Amplify Science@Home resources reference

Use this guide to keep track of the different resources available for remote and hybrid learning.

<b>Instructional materials:</b> Click Remote and hybrid learning resources, then select your grade level from the dropdown menu. Select your unit.	
<b>@Home Unit resources:</b> These will appear when you select your unit.	
Teacher Overview	General information for teaching with @Home Units, planning information, chapter and lesson outlines
Lesson Index	Lists the original Amplify Science lessons associated with each @Home lesson, and the Investigation Notebook pages, copymasters, and print materials associated with the @Home Unit Student Sheets
Family Overview	Information to send home to families to help them support students with remote learning
Student lesson materials for @Home Units	Printable or digital lessons condensed to be about 30 minutes long. You can access compilations of all student materials for your unit, or select from individual lessons.
<b>@Home Video resources:</b> After selecting your grade level and unit, select the @Home Videos tab below your unit title.	
@Home Video links	Links to video lessons that include all activities from the original units. Lesson playlists are on YouTube, and they autoplay in a playlist form.
<b>Additional remote and hybrid instructional materials:</b> These can be accessed from the tabs below your unit title.	
Hands-on investigations support	Videos of every unit's hands-on activities (note, these videos also appear in the student lesson materials).
Read-aloud videos	Link to a YouTube playlist of read-aloud videos of all books in your unit.
<b>Orientation and Tutorials:</b> Click Remote and hybrid learning resources, then select your grade from the dropdown menu. Click Orientation and Tutorials. You'll not only find videos to help you use the resources, but also videos you can share with students and caregivers.	

# Work time

Spend time time exploring the Program Hub. Make sure you find:

- @Home Unit Teacher Overview
- @Home Unit Lesson Index

The screenshot displays the AmplifyScience teacher interface. At the top right, the logo "AmplifyScience" is visible. Below it, the text "6th Grade" is shown with a dropdown arrow. On the left side, a sidebar menu is open, showing a hamburger menu icon at the top. Below the menu icon, the text "Hello Teacher Considine" and the email "t.lconsidine@tryamplify.net" are displayed. Further down, there are links for "Log Out" and "Go To My Account" with a gear icon. A "Classroom Language Settings" button is also present. The main content area shows a grid of icons: "LA Science Program Guide" (lightbulb icon), "Program Hub" (briefcase icon, highlighted with an orange arrow), "Science Program Guide" (lightbulb icon), "Standards Map" (orange icon with "FLORIDA EDITION" text), and "Help" (squirrel icon). Below the icons, there are two lesson cards: "Microbiome" with "11 Lessons" and "Metabolism" with "19 Lessons". At the bottom, there are logos for "FUTURA FOOD ENGINEERING" and a house icon with a bar chart and a plant.

AmplifyScience

Hello Teacher Considine  
t.lconsidine@tryamplify.net

Log Out

Go To My Account ⚙️

Classroom Language Settings

LA Science Program Guide

Program Hub

Science Program Guide

Standards Map  
FLORIDA EDITION

Help

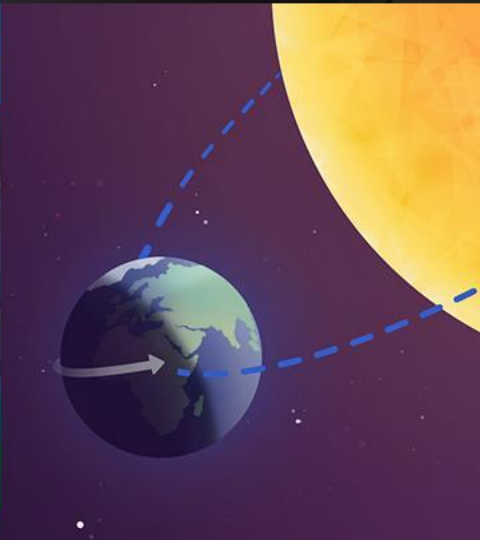
6th Grade ▾

11 Lessons  
Microbiome

19 Lessons  
Metabolism

FUTURA  
FOOD ENGINEERING

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<https://www.amplify.com/floridastandards>



## Plan for the day

- Introduction and framing
- Phenomenon at the unit level
- Program Hub
- **Constructing explanations at the chapter level**
- Reflection and closing

# Constructing explanations at the chapter level

## Framing this section

During this part of the day, we'll focus on how students get from the **question** at the beginning of a chapter to the **explanation** at the end of a chapter.

**Chapter Question:** How did the fossil get inside the rocky outcrop?



**Explanation:** The park used to be under water. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More sediment built up, compacted, and was cemented into a rock layer.

# Constructing science knowledge

In order to progress through a unit storyline, students figure out general science ideas they can use to explain the phenomenon.

Chapter Question: How did the fossil get inside the rocky outcrop?

Investigation Question

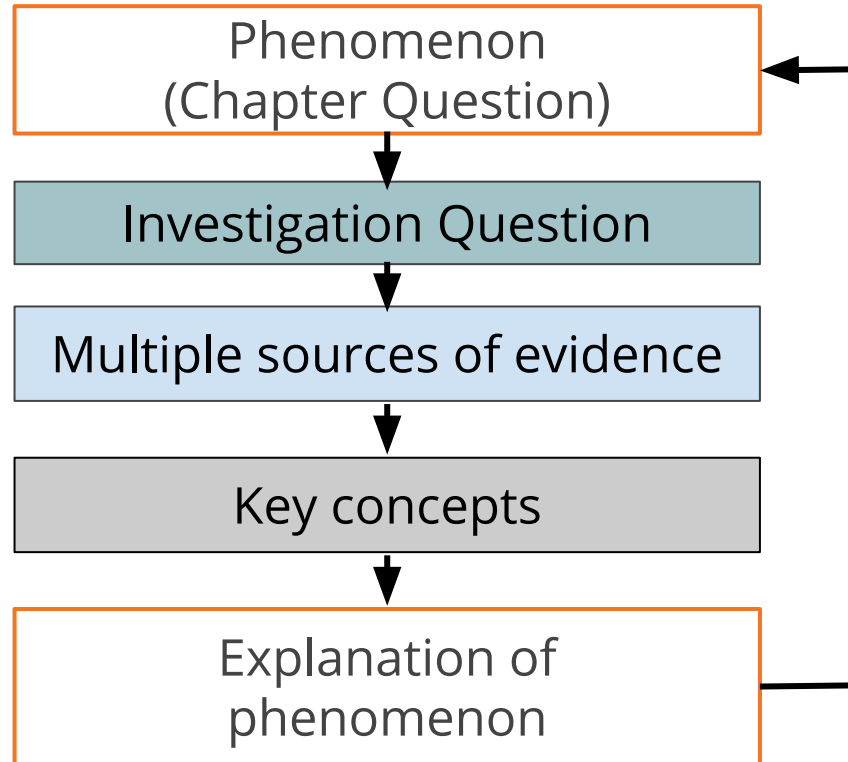
Multiple sources of evidence

Key concepts

Explanation: The park used to be under water. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More sediment built up, compacted, and was cemented into a rock layer.

# Coherence flowchart

## A diagram of student learning



## Planning for the Unit

Unit Overview



Unit Map



Progress Build



Getting Ready to Teach



Materials and Preparation



Science Background



Standards at a Glance



## Teacher References

Lesson Overview Compilation



Standards and Goals



3-D Statements



Assessment System



Embedded Formative Assessments



Books in This Unit




Apps in This Unit




Flexextensions in This Unit



## Printable Resources


 3-D Assessment Objectives

 Coherence Flowcharts

 Copymaster Compilation

 Flexextension Compilation

 Investigation Notebook

 Multi-Language Glossary

 NGSS Information for Parents and Guardians

 Print Materials (8.5" x 11")

 Print Materials (11" x 17")

## Offline Preparation

Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.

Offline Guide

## Unit Anchor Phenomenon

*Problem students work to solve*

## Chapter-level Anchor Phenomenon Chapter 1 Question

## Investigative Phenomena Investigation Questions

## Evidence sources and reflection opportunities

## Key concepts

## Application of key concepts to problem

## Explanation that students can make to answer the Chapter 1 Question

# Earth's Features: Mystery in Desert Rocks Canyon

A rocky outcrop in Desert Rocks National Park has rock layers and a fossil in it.  
*What was the environment of Desert Rocks National Park like in the past?*

A rocky outcrop in Desert Rocks National Park has a fossil in it  
*How did the fossil get inside the rocky outcrop?*

There are fossils in the world.  
*How do fossils form? (1.2-1.3)*

There is sedimentary rock in the world.  
*How does sedimentary rock form? (1.4-1.5)*

- Discuss initial ideas about rocks and fossils, add them to the Rocks and Fossils Anticipatory Chart (1.1)
- Read *Clues from the Past* (1.2)
- Observe fossils (1.3)
- Use the Sim to investigate how fossils form (1.3)

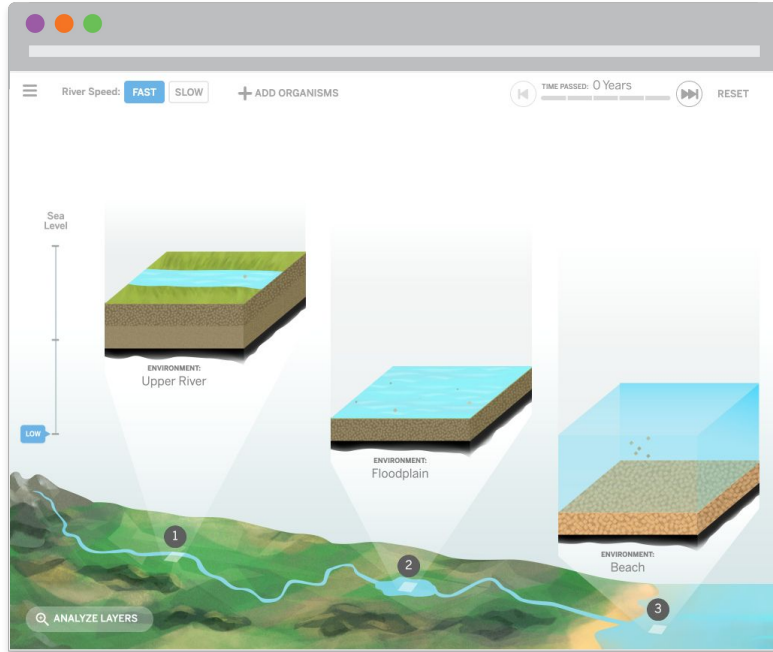
- Observe conglomerate rock samples (1.4)
- Use the Sim to investigate how sedimentary rock forms (1.4)
- Revisit *Clues from the Past* to obtain information about how sedimentary rock forms (1.5)
- Develop student sedimentary rock formation models (1.5)
- Discuss and evaluate the class sedimentary rock formation model (1.5)
- Revisit the Rocks and Fossils Anticipatory Chart to reflect on new ideas (1.5)

- A fossil forms when an organism dies and is covered with sediment that turns into rock. (1.3)

- A sedimentary rock layer forms when sediment sinks and builds up in water, compacts under more sediment, and cements over time. (1.5)
- Over time, a rock layer becomes thicker as sediment continues to build up. (1.5)

- Use the Evidence Circles routine to prepare to write an argument about the Chapter 1 Question (1.6)
- Shared write an argument about the Chapter 1 Question (1.6)

The fossil is the preserved remains of an organism that lived a long time ago. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More and more sediment continued to build up over the body. As more sediment landed on top, it compacted the sediment that was already there. That sediment cemented and became rock. This process gradually made a thicker and thicker rock layer. Parts of the organism became preserved in this rock layer.



We can't observe fossils forming because it takes a **very long time**, so we will gather information about how fossils form by using a **model**.

The *Earth's Features* Simulation (Sim) is a model.



**model**

something scientists make to answer questions  
about the real world

First, we will **watch a video** to learn more about the *Earth's Features* Sim.

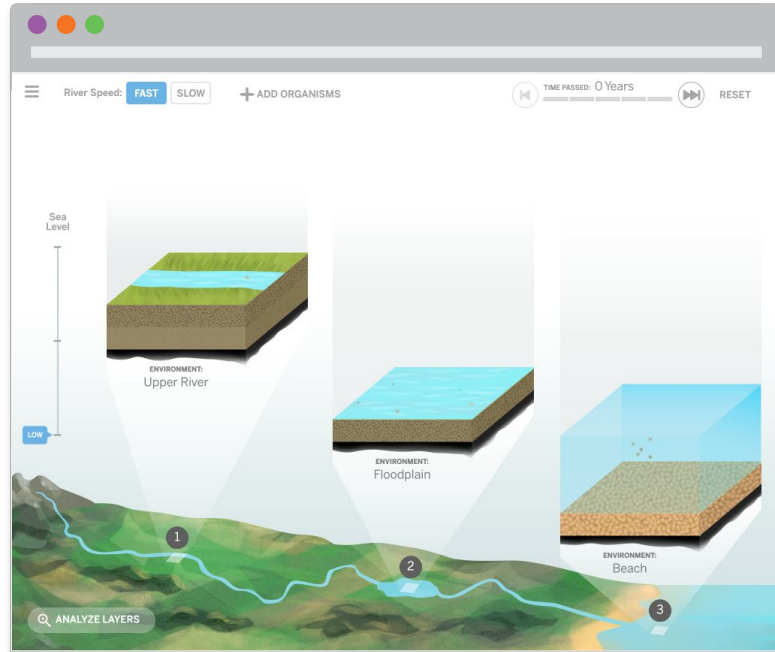
Then, you will use the Sim to **investigate** fossils.

Note: All videos in this @Home Unit can be viewed on a smartphone, or any other connected device.

Adjust the **Sea-Level slider** to change the sea level and to change the environments in all three locations.



Using the print version? Find the video at: [tinyurl.com/AMPEF-02](https://tinyurl.com/AMPEF-02)



These are some of the important features of the *Earth's Features* Sim:



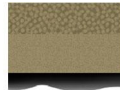
Time controls



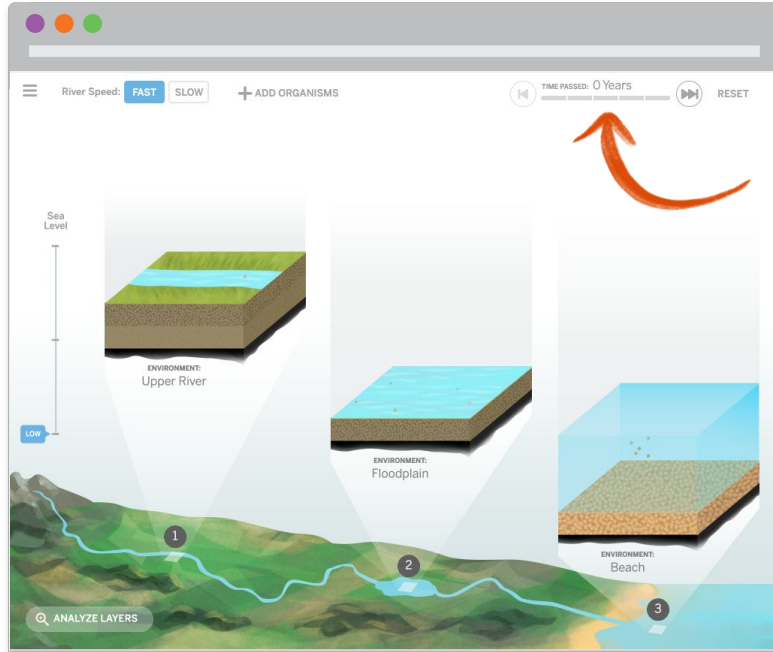
Add organisms



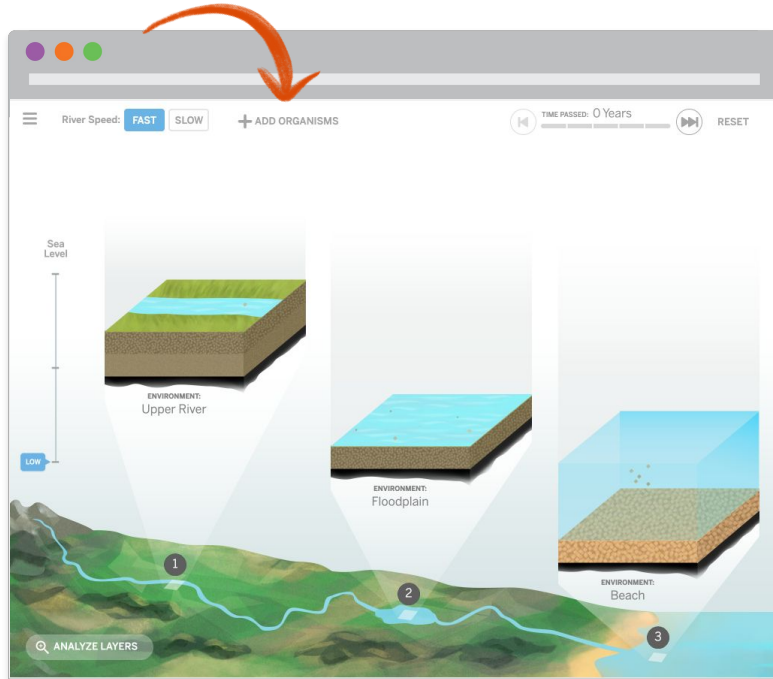
Analyze layers



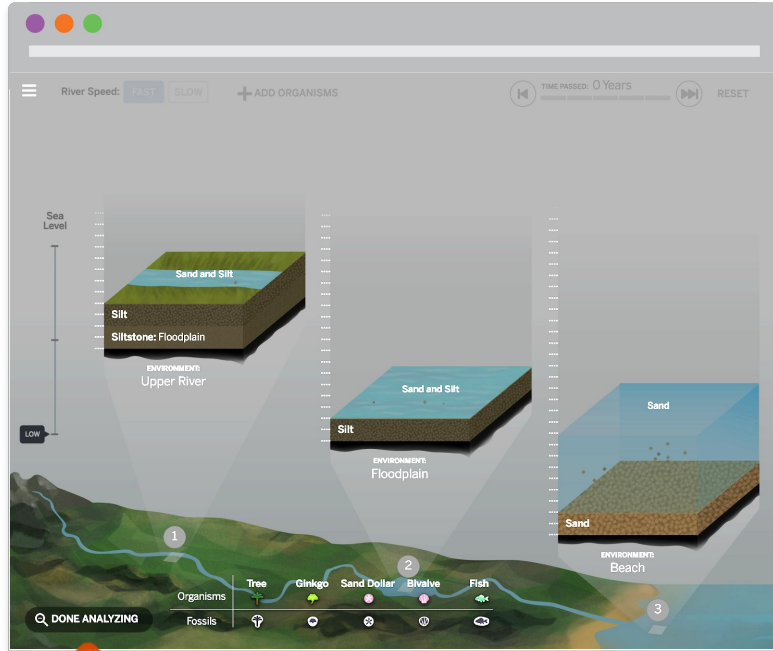
Rock and sediment layers



**Time** can be moved forward or backward by 10,000 years.





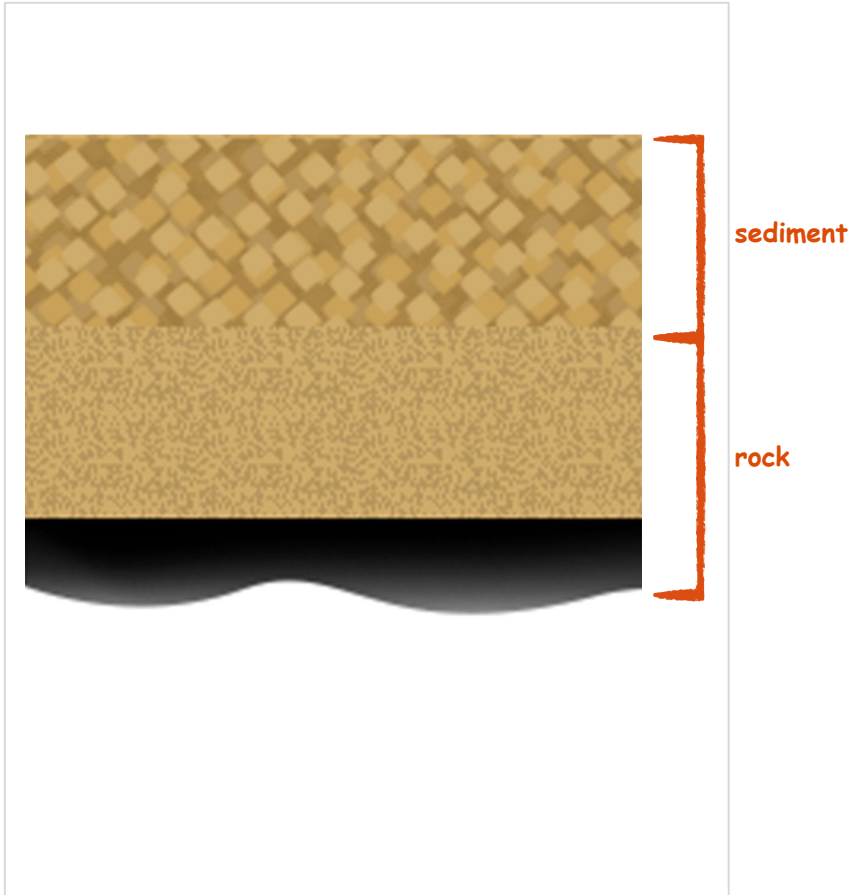
**Organisms** can be added to each location by pressing the **ADD ORGANISMS** button.



Selecting **ANALYZE LAYERS** reveals the types of rock, sediment, organisms, and fossils in each location.

This key, found in **ANALYZE LAYERS**, shows what organisms are featured in the Sim and what they look like if they form into a **fossil**.

	Tree	Ginkgo	Sand Dollar	Bivalve	Fish
Organisms					
Fossils					



You will see **layers** of sediment and rock in the Sim.

The top layer with larger pieces is a **sediment** layer. The lower, smoother layers are **rock**.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### How a Fossil Forms

**Using the Sim?** Follow the Sim Investigation Instructions below.

**Not using the Sim?** Watch the video of someone completing the steps of the Sim investigation at [tinyurl.com/AMPEF-03](https://tinyurl.com/AMPEF-03). Then, answer the questions below.

#### Sim Instructions:

1. Using the *Earth's Features* Simulation, observe how a fossil forms.
2. Press ADD ORGANISMS.
3. Move time forward until a fossil forms.
4. Answer the questions below based on what you observed in the Sim.

How do you think fossils form?

---

---

---

---

Can you find an environment in the Sim where a fossil does not form? What did you observe about that environment?

---

---

---

---

Find the **How a Fossil Forms** page. Use the Sim or watch a video of this Sim investigation.



**Investigate** fossils in the **Sim.**

**Record** your answers to the questions.

# Analyzing the evidence source

Please respond in the chat

How did investigating in the Sim help build our understanding of the key concept?

**Key concept:** A fossil forms when an organism dies and is covered with sediment that turns into rock.

## Unit Anchor Phenomenon

*Problem students work to solve*

## Chapter-level Anchor Phenomenon Chapter 1 Question

## Investigative Phenomena Investigation Questions

## Evidence sources and reflection opportunities

## Key concepts

## Application of key concepts to problem

## Explanation that students can make to answer the Chapter 1 Question

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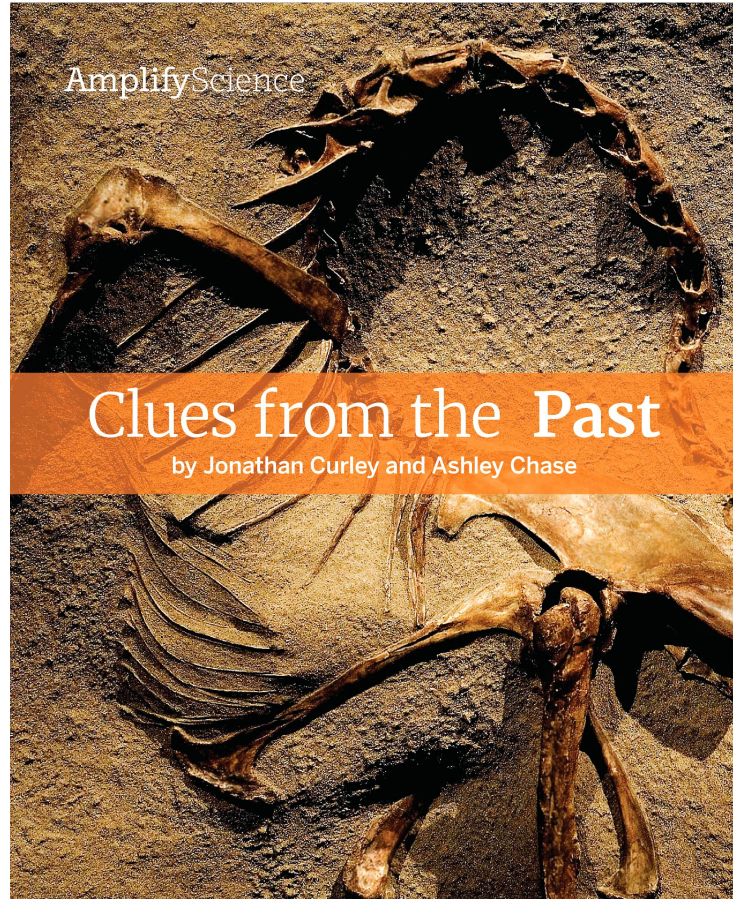
- Observe conglomerate rock samples (1.4)
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- Over time, a rock layer becomes thicker as sediment continues to build up. (1.5)

- Use the Evidence Circles routine to prepare to write an argument about the Chapter 1 Question (1.6)
- Shared write an argument about the Chapter 1 Question (1.6)

The fossil is the preserved remains of an organism that lived a long time ago. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More and more sediment continued to build up over the body. As more sediment landed on top, it compacted the sediment that was already there. That sediment cemented and became rock. This process gradually made a thicker and thicker rock layer. Parts of the organism became preserved in this rock layer.



Now, we will look back at the book *Clues from the Past* to learn more about how **sedimentary rocks** form.

Using the digital library? Find the book at [tinyurl.com/AMPEF-61](https://tinyurl.com/AMPEF-61)  
Watching a read-aloud video? Find the video at [tinyurl.com/AMPEF-01](https://tinyurl.com/AMPEF-01)



These fossils come from organisms that were trapped in sediment at the bottom of a shallow ocean. The sediment turned into sedimentary rock, and the organisms turned into fossils.

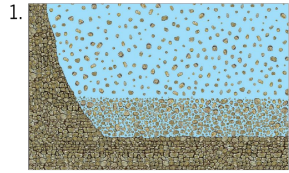
Fossils are usually found in a certain type of rock: **sedimentary rock**. To understand fossils, we need to look at how sedimentary rock forms from **sediment**. Sediment is made up of sand, mud, and tiny bits of rock. When organisms die, sometimes their bodies can become trapped in sediment.

You will need a **partner** to talk with as you look back at the book. Turn to **page 6**.

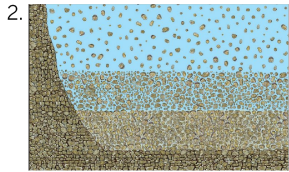


**Reread this page.**

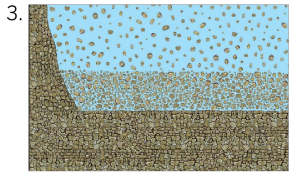
Your partner can be a family member,  
a friend or classmate on the phone,  
a stuffed animal, or even a pet!



Sediment sinks through water and builds up on the bottom of lakes, rivers, oceans, and other watery **environments**. Over time, more and more sediment builds up and pushes down on the sediment below it.



The sediment at the bottom starts to **compact**, or press together. As the sediment compacts, all the tiny bits of sand and rock begin to **cement**, or stick to one another.



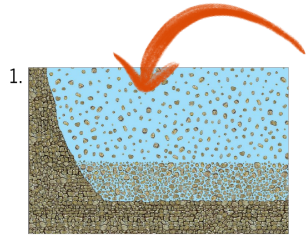
The sediment compacts and cements to form a large, flat layer of sedimentary rock. Over many years, that layer gets thicker as more sediment compacts and cements.

You can't see sedimentary rock forming because it takes a very, very long time. It takes much longer for a **rock layer** to form than you have been alive. In fact, it takes much longer than even the oldest person you know has been alive!

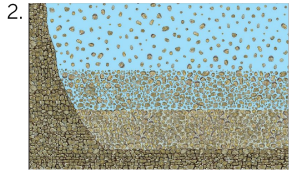
Turn to page 7. Next to each illustration of how sedimentary rock forms is a description of two steps in the process.



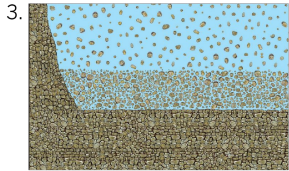
Read this page carefully.



Sediment sinks through water and builds up on the bottom of lakes, rivers, oceans, and other watery **environments**. Over time, more and more sediment builds up and pushes down on the sediment below it.



The sediment at the bottom starts to **compact**, or press together. As the sediment compacts, all the tiny bits of sand and rock begin to **cement**, or stick to one another.



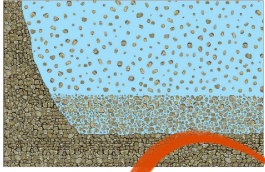
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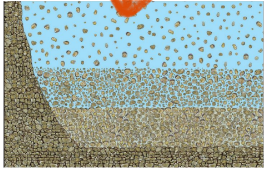
You can't see sedimentary rock forming because it takes a very, very long time. It takes much longer for a **rock layer** to form than you have been alive. In fact, it takes much longer than even the oldest person you know has been alive!

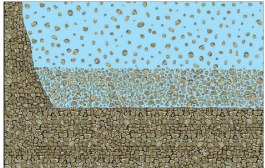
Look closely at the first illustration and paragraph.



What are the **first two steps** in the process of sedimentary rock formation?

- 

1. Sediment sinks through water and builds up on the bottom of lakes, rivers, oceans, and other watery **environments**. Over time, more and more sediment builds up and pushes down on the sediment below it.
- 

2. The sediment at the bottom starts to **compact**, or press together. As the sediment compacts, all the tiny bits of sand and rock begin to **cement**, or stick to one another.
- 

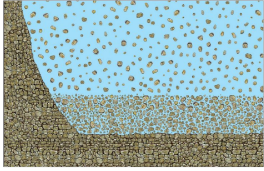
3. The sediment compacts and cements to form a large, flat layer of sedimentary rock. Over many years, that layer gets thicker as more sediment compacts and cements.

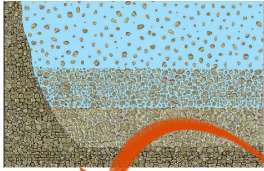
You can't see sedimentary rock forming because it takes a very, very long time. It takes much longer for a **rock layer** to form than you have been alive. In fact, it takes much longer than even the oldest person you know has been alive!

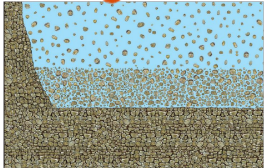
Look closely at the **second illustration and paragraph**.



What are the **next two steps** in the process of sedimentary rock formation?

- 

1. Sediment sinks through water and builds up on the bottom of lakes, rivers, oceans, and other watery **environments**. Over time, more and more sediment builds up and pushes down on the sediment below it.
- 

2. The sediment at the bottom starts to **compact**, or press together. As the sediment compacts, all the tiny bits of sand and rock begin to **cement**, or stick to one another.
- 

3. The sediment compacts and cements to form a large, flat layer of sedimentary rock. Over many years, that layer gets thicker as more sediment compacts and cements.

You can't see sedimentary rock forming because it takes a very, very long time. It takes much longer for a **rock layer** to form than you have been alive. In fact, it takes much longer than even the oldest person you know has been alive!

Look closely at the **third illustration and paragraph.**



What are the **last two steps** in the process of sedimentary rock formation?

This is the end of the partner work in this lesson.

Sediment can be **compacted**, or pushed down, over time to form sedimentary rock.



**compact**

to press together

**Sediment cements, or is glued together, to form sedimentary rock.**

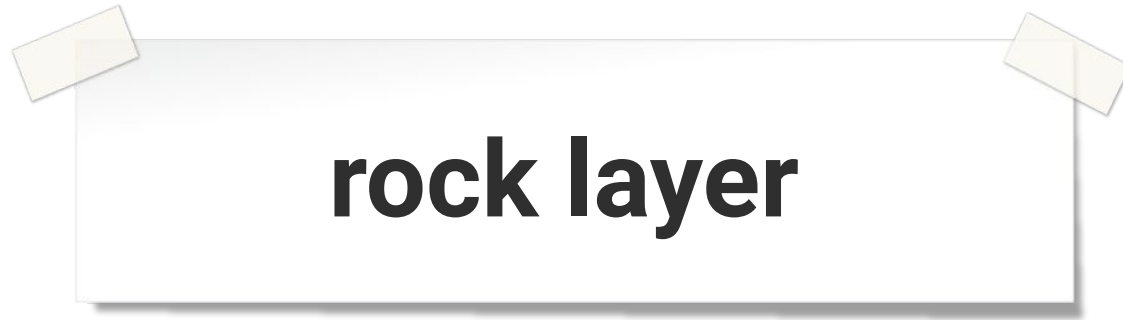


**cement**

**to stick together in the process of forming rock**

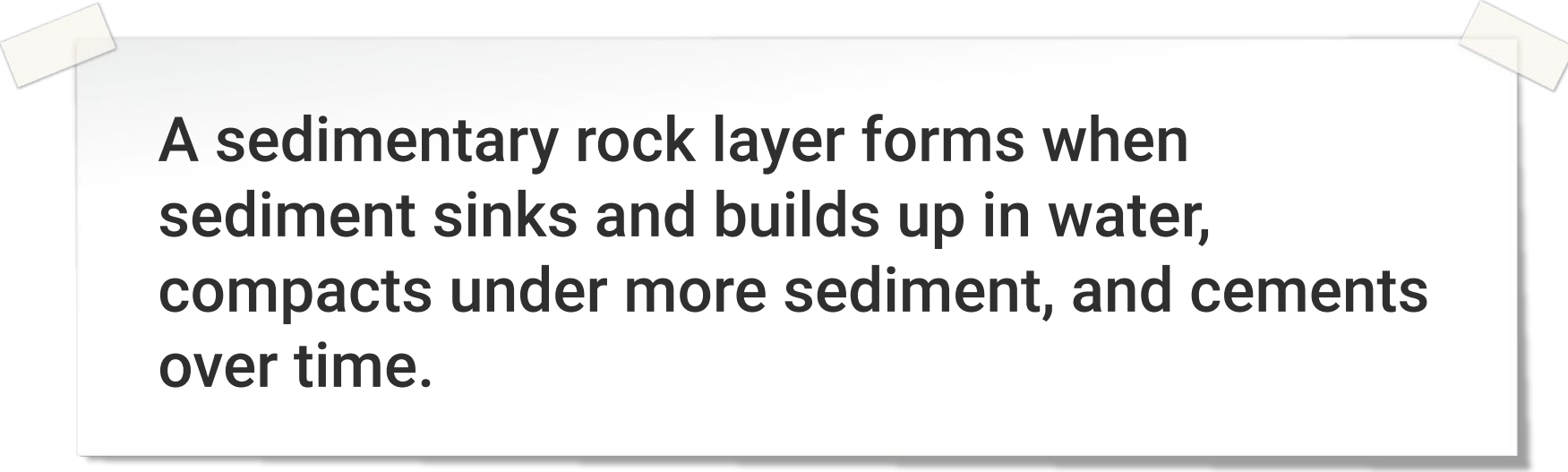
**Sedimentary rock** can take **thousands** or **millions** of years to form. Since this process takes such a long time, we can't observe it happening.

**It takes much longer than a lifetime for a rock layer to form.**



**a thick sheet of rock formed from the same material**

From our investigation and discussion, we have figured out a new **key concept**:



A sedimentary rock layer forms when sediment sinks and builds up in water, compacts under more sediment, and cements over time.

From our investigation and discussion, we have figured out another new **key concept**:



**Over time, a rock layer becomes thicker as sediment continues to build up.**



Even though this place looks like it wouldn't change very much each day, we know that over thousands or millions of years, **new rocks form**. So, over millions of years, this place changes a lot!

# Analyzing the evidence source

Please respond in the chat

How did obtaining information from *Clues from the Past* help build our understanding of the key concepts?

## Key concept:

A sedimentary rock layer forms when sediment sinks and builds up in water, compacts under more sediment, and cements over time.

Over time, a rock layer becomes thicker as sediment continues to build up.

# Evidence sources work together

Please respond in the chat

How did the two evidence sources, and the two key concepts they supported, work together to bring students to the Chapter 1 explanation?

**Chapter Question:** How did the fossil get inside the rocky outcrop?



**Explanation:** The park used to be under water. The fossil formed when the organism died and sediments sank through the water and completely covered its body. More sediment built up, compacted, and was cemented into a rock layer.

# Coherent remote instruction

## Chapter 1 @Home Teacher Outline

### @Home Lessons 1–4

#### Chapter 1 @Home at a Glance

##### Chapter 1 Question:

How did the fossil get inside the rocky outcrop? (Lesson 1)

##### Investigation Question:

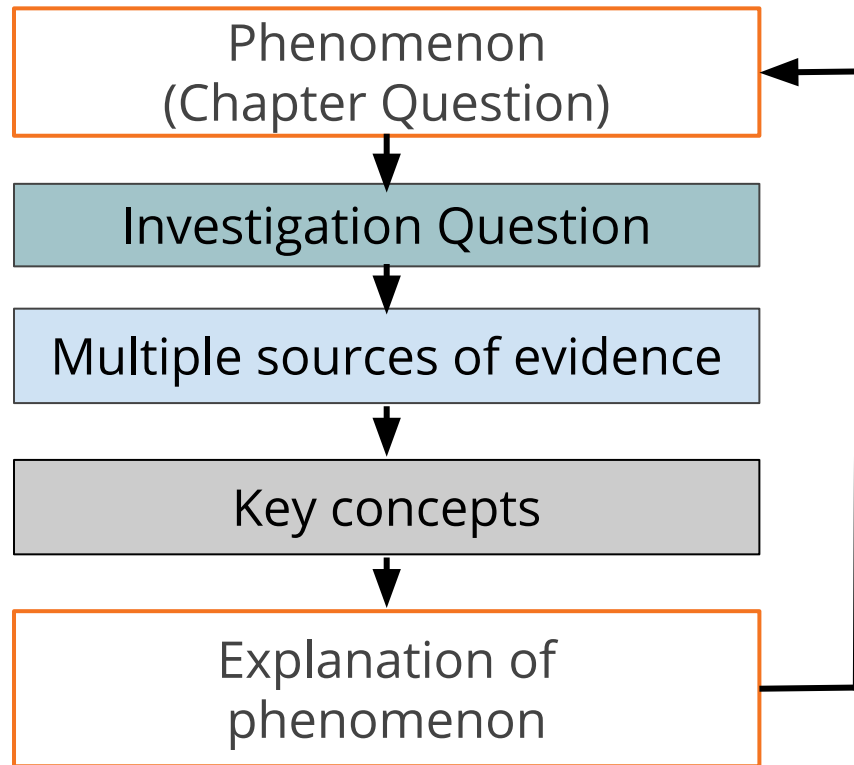
How do fossils form? (Lessons 1–2)

- **Key concepts:**
  - A fossil forms when an organism dies and is covered with sediment that turns into rock. (Lesson 2)
- **Vocabulary:**
  - *geologist, observation, inference, fossil* (Lesson 1)
  - *model, sediment* (Lesson 2)

##### Investigation Question:

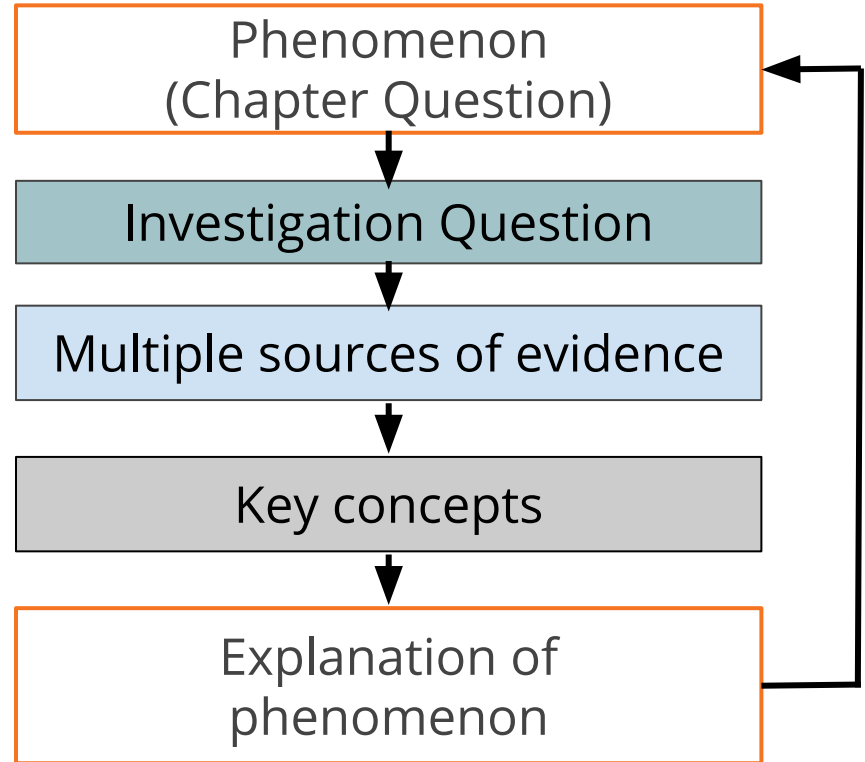
How does sedimentary rock form? (Lesson 3)

- **Key concepts:**
  - A sedimentary rock layer forms when sediment sinks and builds up in water, compacts under more sediment, and cements over time. (Lesson 3)
  - Over time, a rock layer becomes thicker as sediment continues to build up. (Lesson 3)
- **Vocabulary:**
  - *sedimentary rock, compact, cement, rock layer* (Lesson 3)
  - *claim, evidence, argument* (Lesson 4)



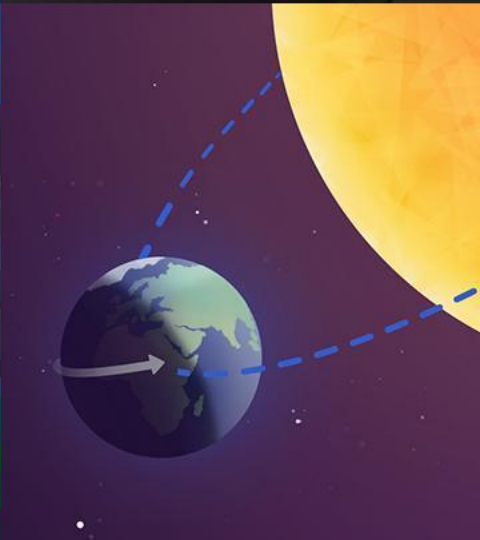
# Breakout groups

How can an understanding of the coherent structure of each chapter inform instructional decisions you make when teaching remotely?





# Questions?



## Plan for the day

- Introduction and framing
- Phenomenon at the unit level
- Program Hub
- Constructing explanations at the chapter level
- **Reflection and closing**

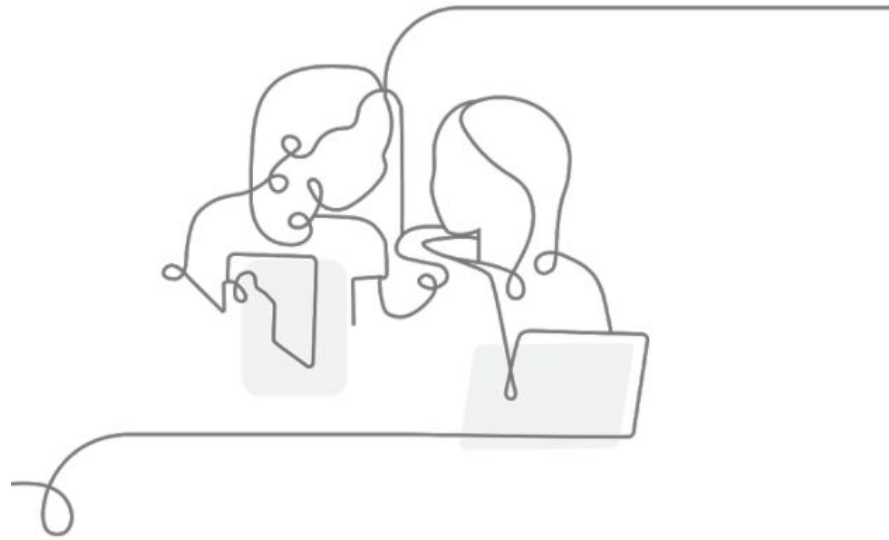
# Head or hands reflection

Reflect independently, then volunteer to share

Based on our work today with the unit storyline and the role of evidence sources....

**Head:** What will you keep in mind while you plan?

**Hands:** What will you do when you're teaching?



# During this workshop did we meet our objectives?

Do you feel able to...

- Describe how students' conceptual understanding builds through the unit
- Explain how students figure out the phenomenon throughout the unit
- Leverage understanding of the Amplify Science instructional approach to make instructional decisions while teaching remotely

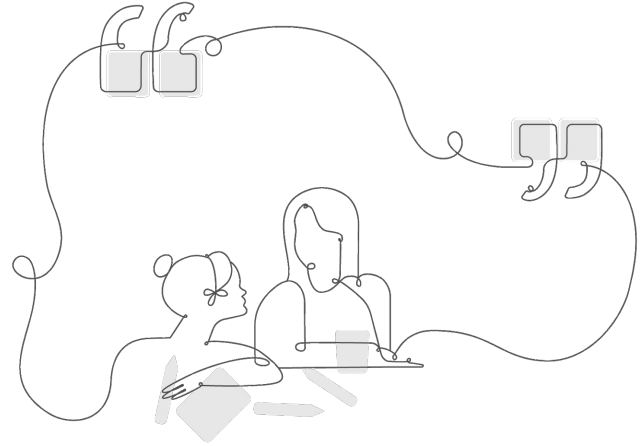
e



# Upcoming LAUSD Office Hours

## Twice Monthly from 4-5pm:

- Thursday, 2/11
- Thursday, 2/25
- Thursday, 3/11
- Thursday, 3/25



<http://bit.ly/TK-6OfficeHours>

# Program Hub: Self Study Resources

The image shows a composite of three overlapping screenshots of the Amplify Science Program Hub website. The leftmost screenshot shows the user interface with a hamburger menu icon circled in red. Below the menu, the user is logged in as 'Hello Teacher Considine' with the email 't.lconsidine@tryamplify.net'. There are links for 'Log Out' and 'Go To My Account' with a settings gear icon. A 'Classroom Language Settings' button is also present. Below these are four icons: 'LA Science Program Guide', 'Program Hub' (highlighted with a red arrow), 'Science Program Guide', and 'Standards Map' (labeled 'FLORIDA EDITION'). At the bottom of this section is a 'Help' icon featuring a bear. The middle screenshot shows a 'Microbiome' unit page with '11 Lessons' and a 'FUTURA FOOD ENGINEERING' logo. The rightmost screenshot shows the 'Welcome Science Educators!' page, which states: 'The Amplify Science Program Hub was created to provide you with resources, tools, and advice for all stages of your implementation.' Below this are three resource categories: 'Remote and hybrid learning resources' (with a laptop icon), 'Professional Learning Resources' (with an icon of three people and a play button, and the text 'Let's get started!'), and 'Additional Unit Materials' (with a folder icon). A red arrow points from the 'Professional Learning Resources' section back to the 'Program Hub' icon in the left sidebar. At the bottom left of the entire image, the URL 'https://www.amplify.com/floridastandards' is visible.

AmplifyScience

## Welcome Science Educators!

The Amplify Science Program Hub was created to provide you with resources, tools, and advice for all stages of your implementation.

### Remote and hybrid learning resources

Amplify Science@Home makes remote and hybrid learning easier.

### Professional Learning Resources

Let's get started!

### Additional Unit Materials

Additional resources to complement the units you're teaching.

LA Science Program Guide

Program Hub

Science Program Guide

FLORIDA EDITION

Standards Map

Help

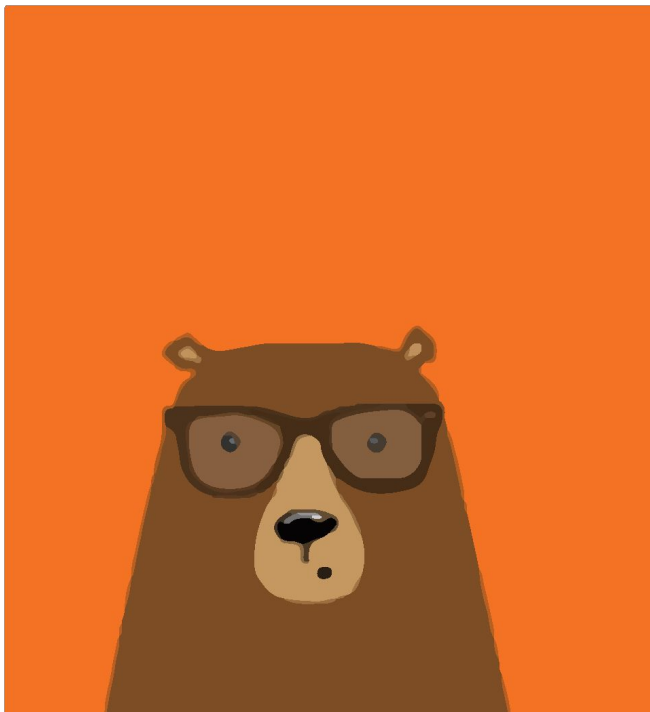
11 Lessons

Microbiome

FUTURA  
FOOD ENGINEERING

© 2020 Amplify Education, Inc.  
<https://www.amplify.com/floridastandards>

# Back to school national webinar series



## Topics included:

- Remote and hybrid learning support
- Navigation support
- What's new for 2020-2021
- Planning support
- Curriculum overview

**[bit.ly/BTSwebinars](https://bit.ly/BTSwebinars)**

# Additional Amplify resources

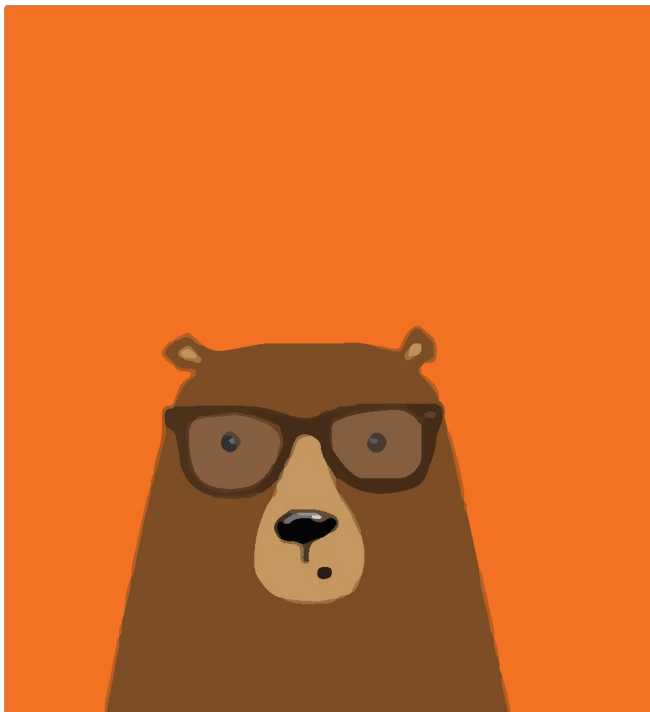


## Caregivers site

Provide your students' families information about Amplify Science and what students are learning

**[amplify.com/amplify-science-family-resource-intro/](https://amplify.com/amplify-science-family-resource-intro/)**

# Additional Amplify resources



## Program Guide

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

**<https://cascience.wpengine.com/content/welcome-k-8/integrated-model/>**

## Amplify Help

Find lots of advice and answers from the Amplify team.

**[my.amplify.com/help](https://my.amplify.com/help)**

# Additional Amplify Support

## Customer Care

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support, weekdays 7AM-7PM EST.



scihelp@amplify.com



800-823-1969



Amplify Chat

## When contacting the customer care 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.

# Please provide us feedback!

## Respond to the survey that has been dropped into chat

## Presenter name:

Date: xx