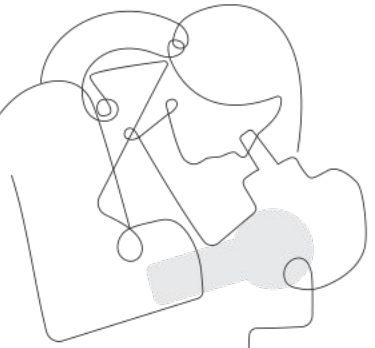
Do Now: *In the chat, share one new skill you and/or your students have learned this year during remote learning.*

Amplify Science

Unpacking Waves, Energy and Information for Hybrid Learning

Unit 4, Grade 4



LAUSD

4/x/2021

Presented by Your Name

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

Amplify.

Objectives

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
- Make a plan for implementing Amplify Science within your class schedule and instructional format

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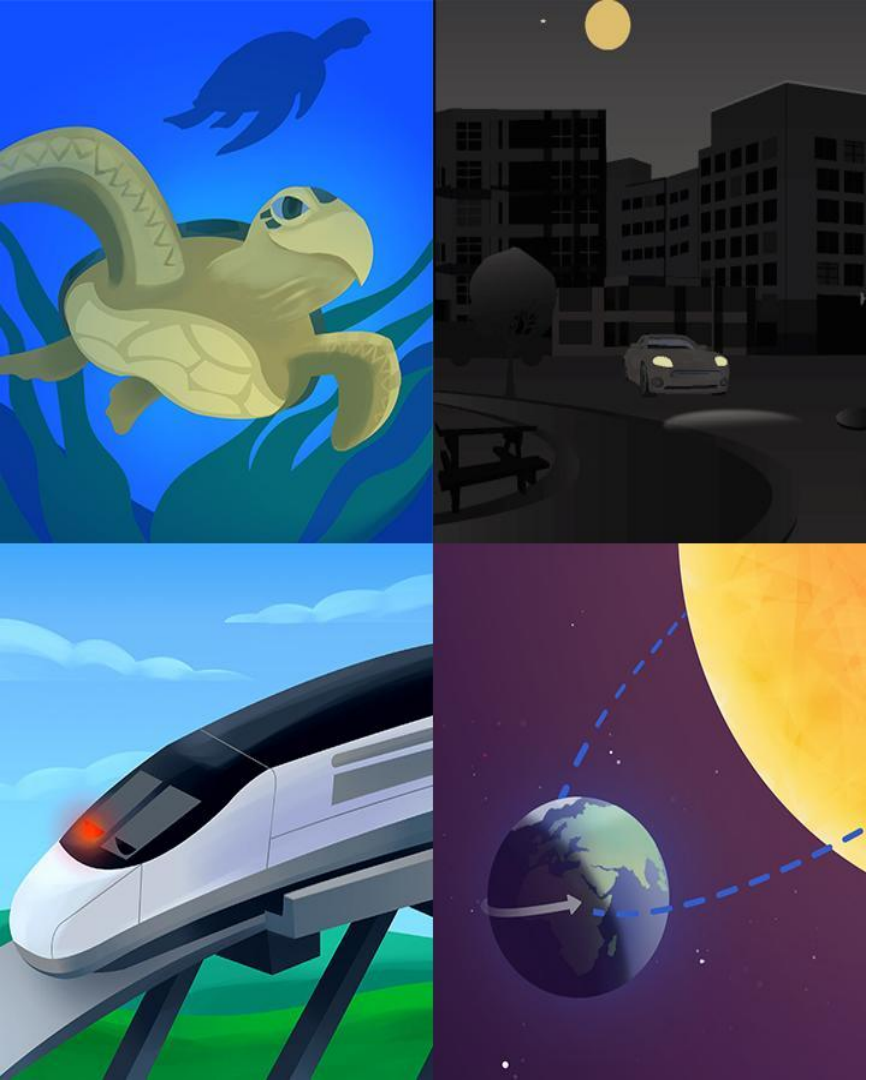
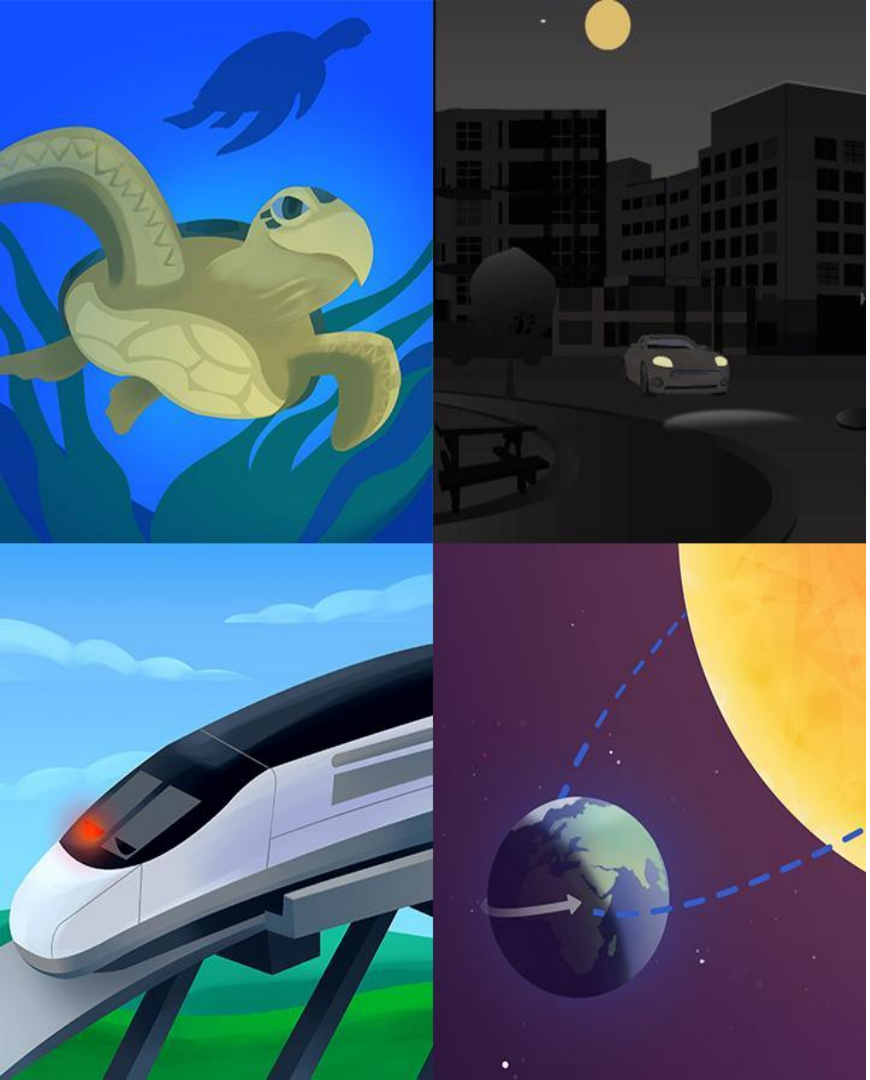


Plan for the day

- **Framing the day**
  - Remote learning reflection
  - Revisiting the Amplify Approach
- **Phenomenon at the unit level**
  - Navigation refresher (standard curriculum)
  - Storyline and science concepts
  - Unit internalization work time
- **Planning to teach**
  - Navigation refresher (@Home resources)
  - Lesson walkthrough
  - Collaborative planning time
- **Closing**
  - Reflection & survey



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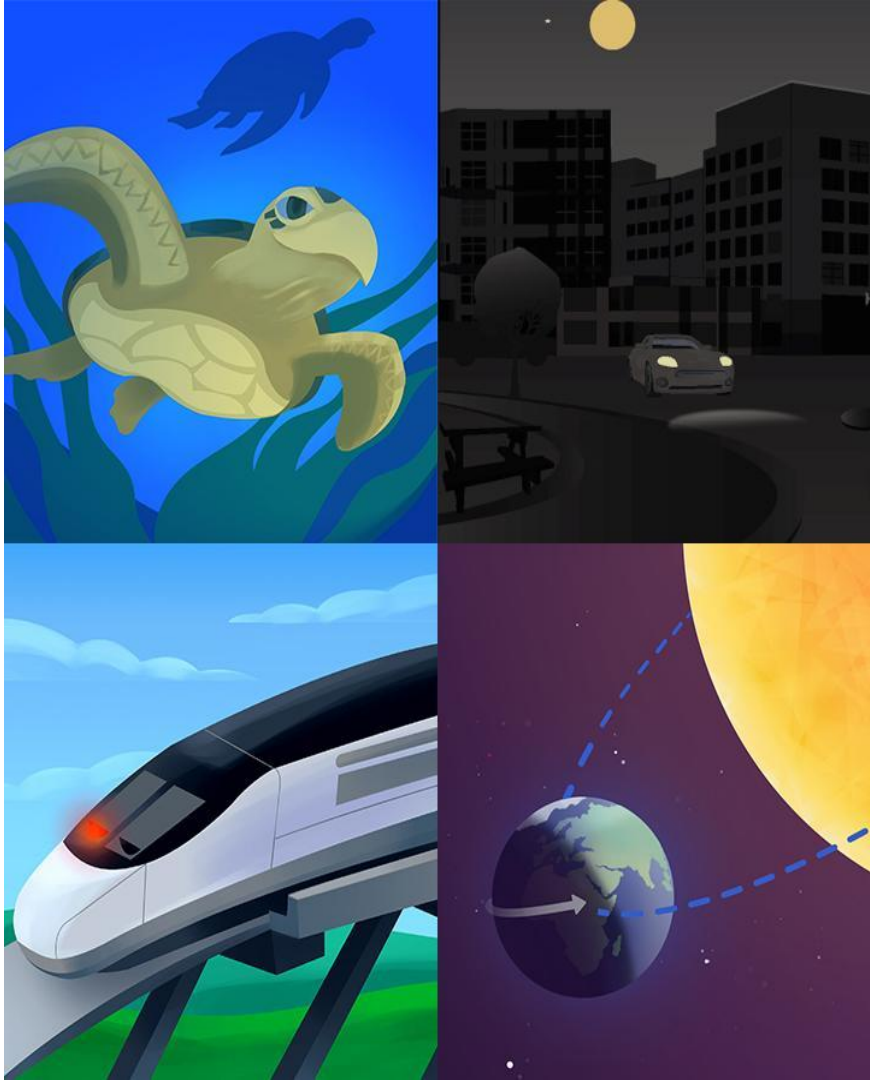
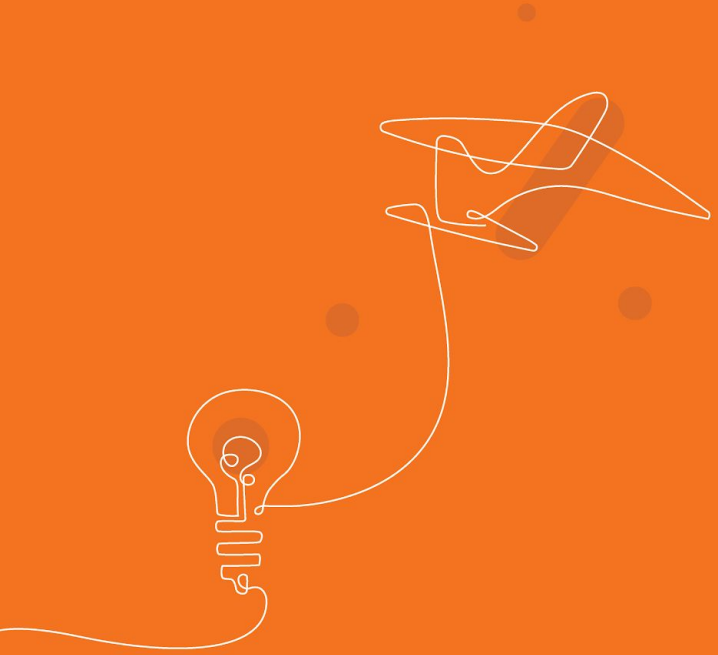
Opening reflection

Jamboard

Having taught Amplify Science in a remote setting, what **skills and/or practices** have you developed with your students that you can **leverage as your shift to hybrid learning?**





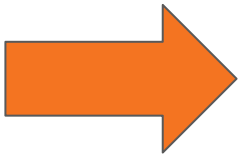
Key aspects of the Amplify Science instructional approach

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 edge of the cliff get to be so close to the flagpole?

Chapter 2 Question

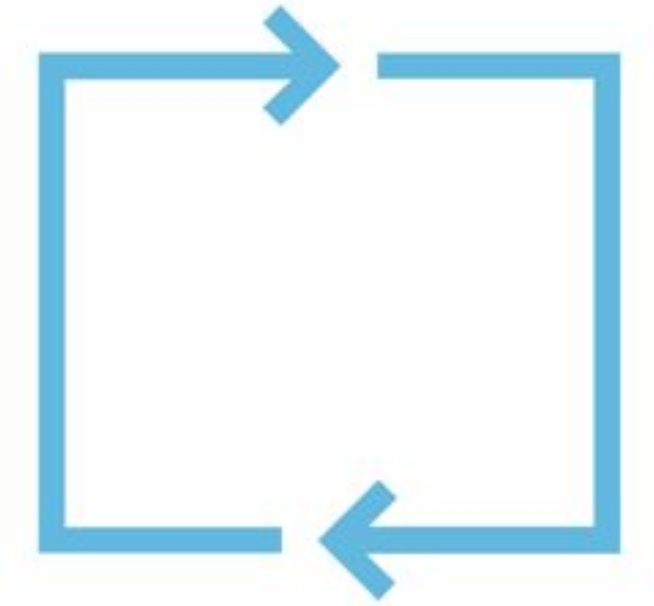
How did the recreation center's cliff change?

22 Lessons

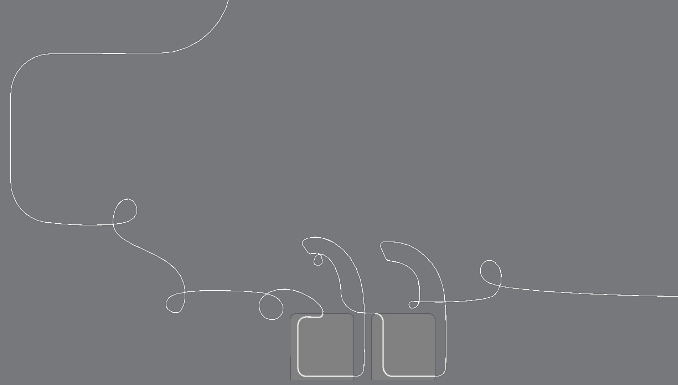
Changing Landforms

Multimodal learning

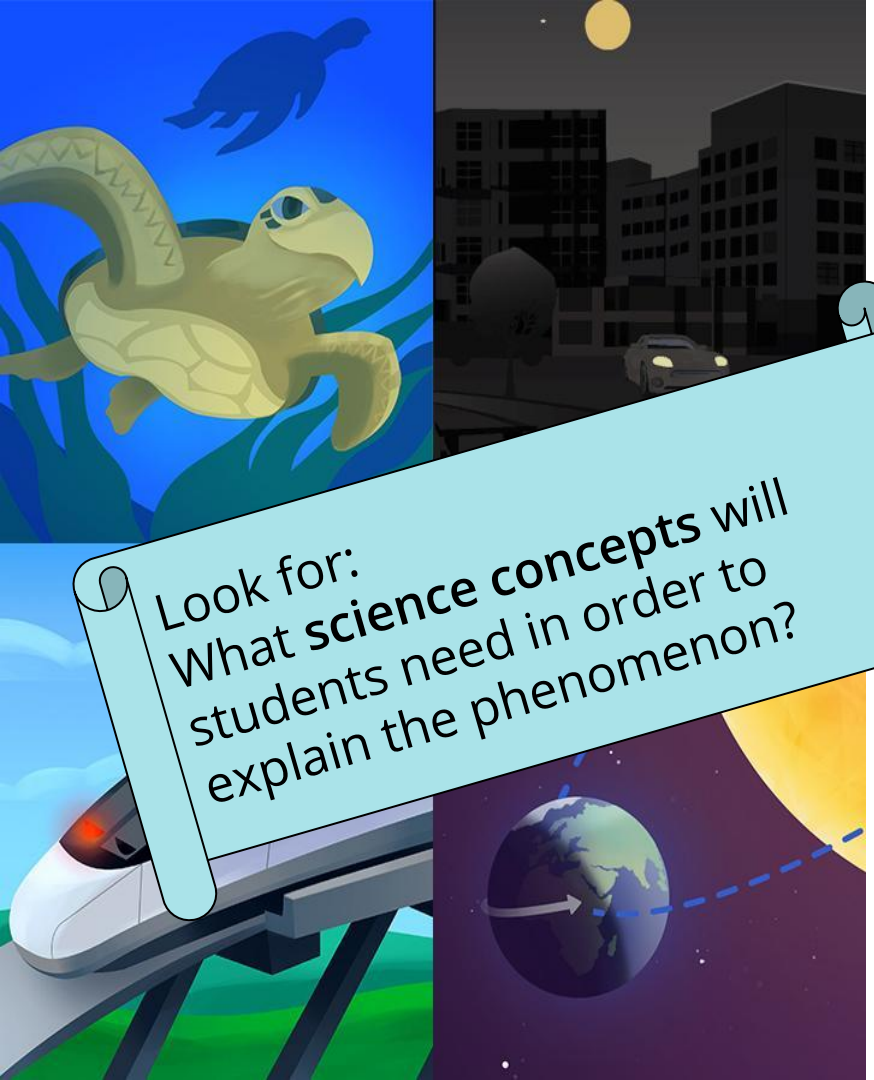
Gathering evidence over multiple lessons



Do,
Talk,
Read,
Write,
Visualize



Questions?



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- **Closing**
  - Reflection & survey

Explaining the phenomenon: science concepts

Please respond in the chat

What **science concepts** do you think students need to understand in order to construct an explanation of why the cliff is changing?

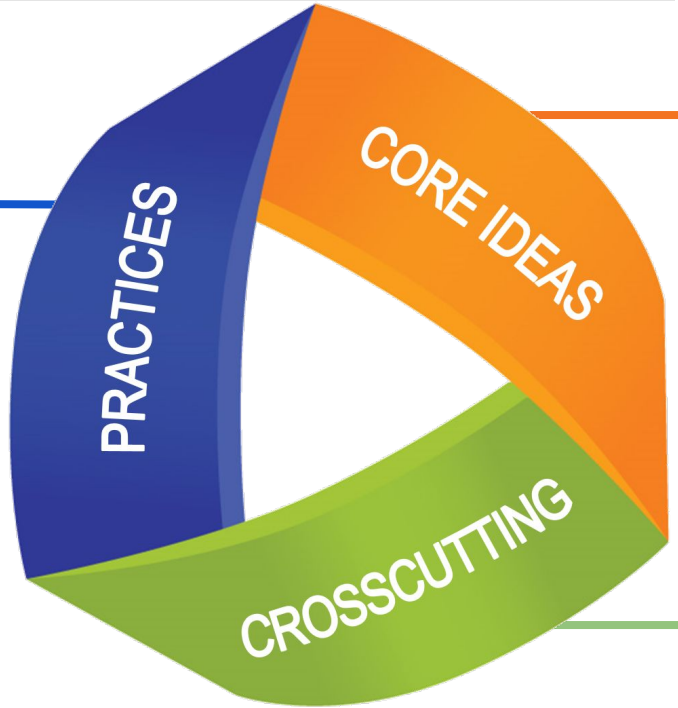
Nearby Cliff

Next Generation Science Standards

Designed to help students build a cohesive understanding of science

What scientists do

Science and Engineering Practices



What scientists want to know

Disciplinary Core Ideas

How scientists think

Crosscutting Concepts

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Key

Practices | Disciplinary Core Ideas | Crosscutting Concepts

Unit Level

Students use models to investigate how wind and water cause changes to landforms (cause and effect). They figure out that erosion causes small changes to landforms, which add up to big changes over long periods of time and that landforms made of loose materials can erode much more quickly (scale, proportion, and quantity; stability and change). Throughout the unit, students create diagram models and write explanations to show their developing understanding.

Navigation Temperature Check

Rate yourself on your comfort level accessing Amplify Science materials and navigating a digital curriculum.

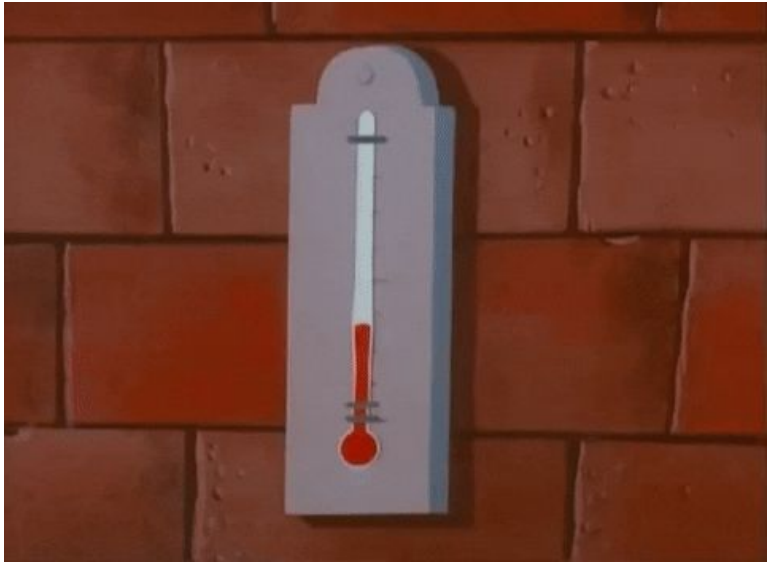
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable

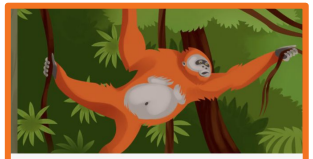


Unit

Chapters

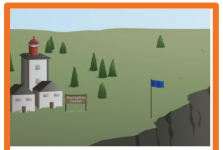
Lessons

Activities



22 Lessons

Weather and Climate



Chapter 1: How did the edge of the cliff get to be so close to the flagpole?

6 Lessons

Chapter 2: How did the recreation center's cliff change?

6 Lessons

Chapter 3: How did the recreation center's cliff erode without the directo...

5 Lessons

Chapter 4: Could the recreation center's cliff erode quickly?

5 Lessons

Lesson 1.1:
Pre-Unit Assessment

Lesson 1.2:
Observations About Landforms

Lesson 1.3:
Observing Sand Samples

Lesson 1.4:
Gary's Sand Journal

Lesson 1.5:
Making Sense of Sand Samples

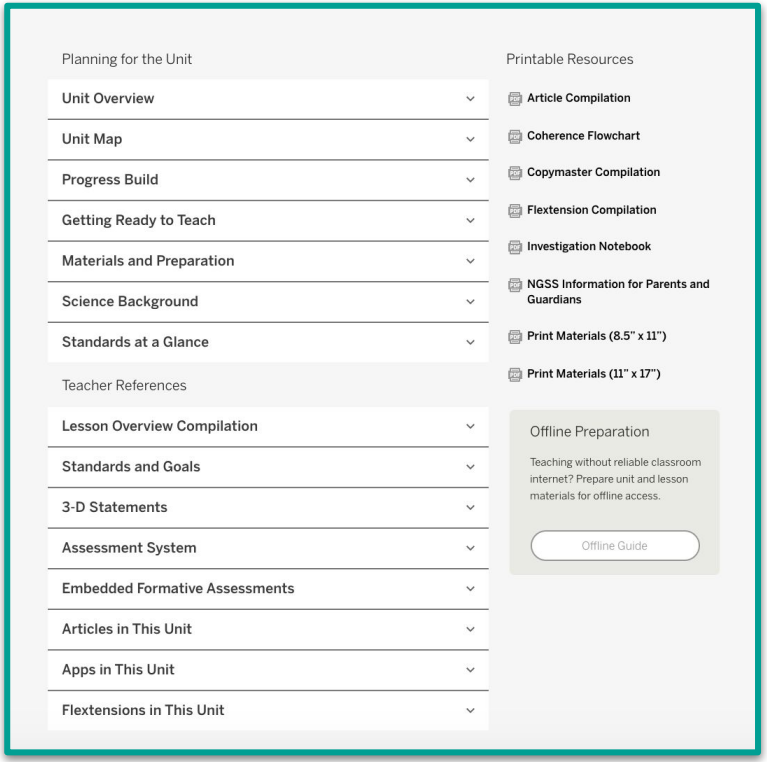
Lesson 1.6:
Explaining Landform Changes

1 TEACHER-LED DISCUSSION
Introducing the Unit

2 WRITING
Writing Initial Explanations

3 READING
Partner Reading

Unit Guide Resources



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

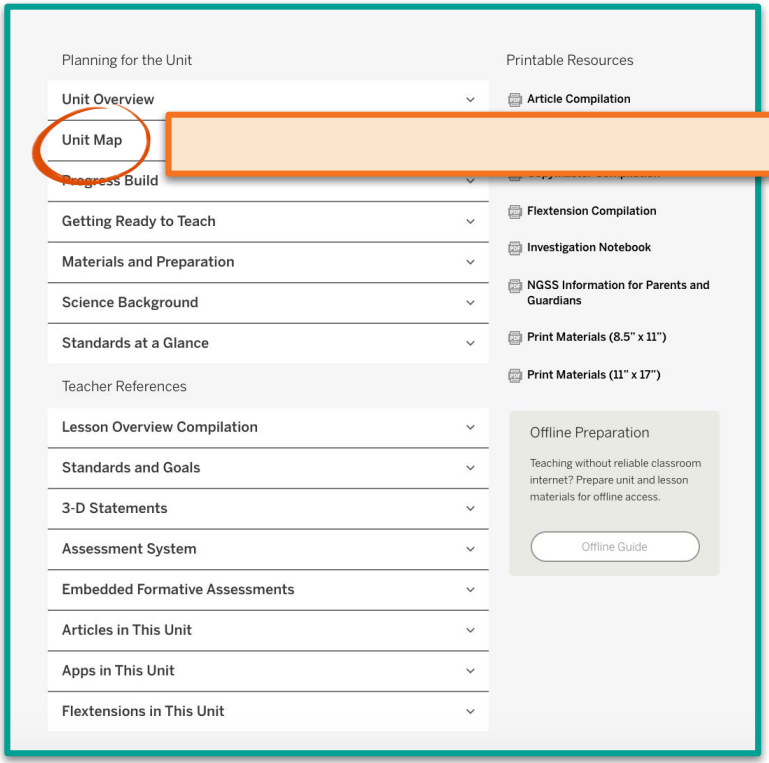
Lesson Overview Compilation	Lesson Overview of each lesson in the unit, including lesson summary, activity purposes, and timing
Standards and Goals	Lists NGSS (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts) and CCSS (English Language Arts and Mathematics) in the 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)

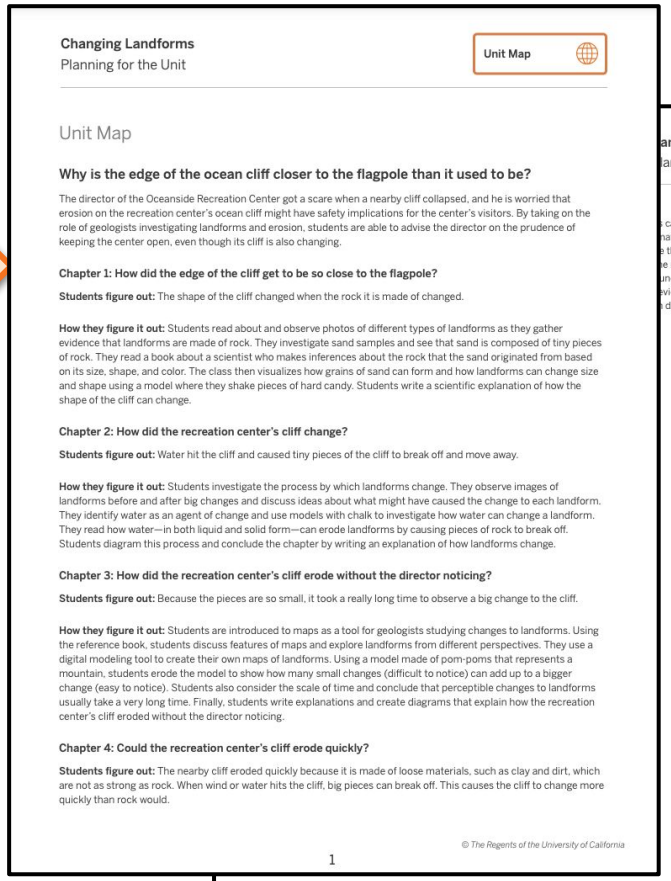
Printable resources

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

Unit Map

Pages 2-3





Changing Landforms
Planning for the Unit

Unit Map

Unit Map

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

The director of the Oceanside Recreation Center got a scare when a nearby cliff collapsed, and he is worried that erosion on the recreation center's ocean cliff might have safety implications for the center's visitors. By taking on the role of geologists investigating landforms and erosion, students are able to advise the director on the prudence of keeping the center open, even though its cliff is also changing.

Chapter 1: How did the edge of the cliff get to be so close to the flagpole?

Students figure out: The shape of the cliff changed when the rock it is made of changed.

How they figure it out: Students read about and observe photos of different types of landforms as they gather evidence that landforms are made of rock. They investigate sand samples and see that sand is composed of tiny pieces of rock. They read a book about a scientist who makes inferences about the rock that the sand originated from based on its size, shape, and color. The class then visualizes how grains of sand can form and how landforms can change size and shape using a model where they shake pieces of hard candy. Students write a scientific explanation of how the shape of the cliff can change.

Chapter 2: How did the recreation center's cliff change?

Students figure out: Water hit the cliff and caused tiny pieces of the cliff to break off and move away.

How they figure it out: Students investigate the process by which landforms change. They observe images of landforms before and after big changes and discuss ideas about what might have caused the change to each landform. They identify water as an agent of change and use models with chalk to investigate how water can change a landform. They read how water—in both liquid and solid form—can erode landforms by causing pieces of rock to break off. Students diagram this process and conclude the chapter by writing an explanation of how landforms change.

Chapter 3: How did the recreation center's cliff erode without the director noticing?

Students figure out: Because the pieces are so small, it took a really long time to observe a big change to the cliff.

How they figure it out: Students are introduced to maps as a tool for geologists studying changes to landforms. Using the reference book, students discuss features of maps and explore landforms from different perspectives. They use a digital modeling tool to create their own maps of landforms. Using a model made of pom-poms that represents a mountain, students erode the model to show how many small changes (difficult to notice) can add up to a bigger change (easy to notice). Students also consider the scale of time and conclude that perceptible changes to landforms usually take a very long time. Finally, students write explanations and create diagrams that explain how the recreation center's cliff eroded without the director noticing.

Chapter 4: Could the recreation center's cliff erode quickly?

Students figure out: The nearby cliff eroded quickly because it is made of loose materials, such as clay and dirt, which are not as strong as rock. When wind or water hits the cliff, big pieces can break off. This causes the cliff to change more quickly than rock would.

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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
	Students figure out...	*So they can explain...*
Chapter 1	Students gather evidence to prove that landforms are made of rock. They figure out that landforms can change shape, size and color.	The shape of the cliff changed when the rock it is made of changed.
Chapter 2		

Chapter 1: How did the edge of the cliff get to be so close to the flagpole?

Students figure out: The shape of the cliff changed when the rock it is made of changed.

How they figure it out: Students read about and observe photos of different types of landforms as they gather evidence that landforms are made of rock. They investigate sand samples and see that sand is composed of tiny pieces of rock. They read a book about a scientist who makes inferences about the rock that the sand originated from based on its size, shape, and color. The class then visualizes how grains of sand can form and how landforms can change size and shape using a model where they shake pieces of hard candy. Students write a scientific explanation of how the shape of the cliff can change.

Page 5

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
	Students figure out...	*So they can explain...*
Chapter 1	Students gather evidence to prove that landforms are made of rock. They figure out that landforms can change shape, size and color.	The shape of the cliff changed when the rock it is made of changed.
Chapter 2	Students investigate the process by which landforms change. Water is an agent of change in both liquid and solid form. It causes pieces of rock to fall away.	The recreation center's cliff changed when pieces of the cliff broke off and fell away when water hit it..

Chapter 2: How did the recreation center's cliff change?

Students figure out: Water hit the cliff and caused tiny pieces of the cliff to break off and move away.

How they figure it out: Students investigate the process by which landforms change. They observe images of landforms before and after big changes and discuss ideas about what might have caused the change to each landform. They identify water as an agent of change and use models with chalk to investigate how water can change a landform. They read how water—in both liquid and solid form—can erode landforms by causing pieces of rock to break off. Students diagram this process and conclude the chapter by writing an explanation of how landforms change.

Applying conceptual understanding to explain the phenomenon

Chapter 3: How did the recreation center's cliff erode without the director noticing?

Students figure out: Because the pieces are so small, it took a really long time to observe a big change to the cliff.

How they figure it out: Students are introduced to maps as a tool for geologists studying changes to landforms. Using the reference book, students discuss features of maps and explore landforms from different perspectives. They use a digital modeling tool to create their own maps of landforms. Using a model made of pom-poms that represents a mountain, students erode the model to show how many small changes (difficult to notice) can add up to a bigger change (easy to notice). Students also consider the scale of time and conclude that perceptible changes to landforms usually take a very long time. Finally, students write explanations and create diagrams that explain how the recreation center's cliff eroded without the director noticing.

away.

Chapter 3	Student geologist use maps as a tool to study changes in landforms. Students also consider the scale of time and conclude that perceptible changes to landforms usually take a very long time.	The director did not notice the cliff erode because the pieces were so small and it took time for the change to be noticed.
Chapter 4		

Applying conceptual understanding to explain the phenomenon

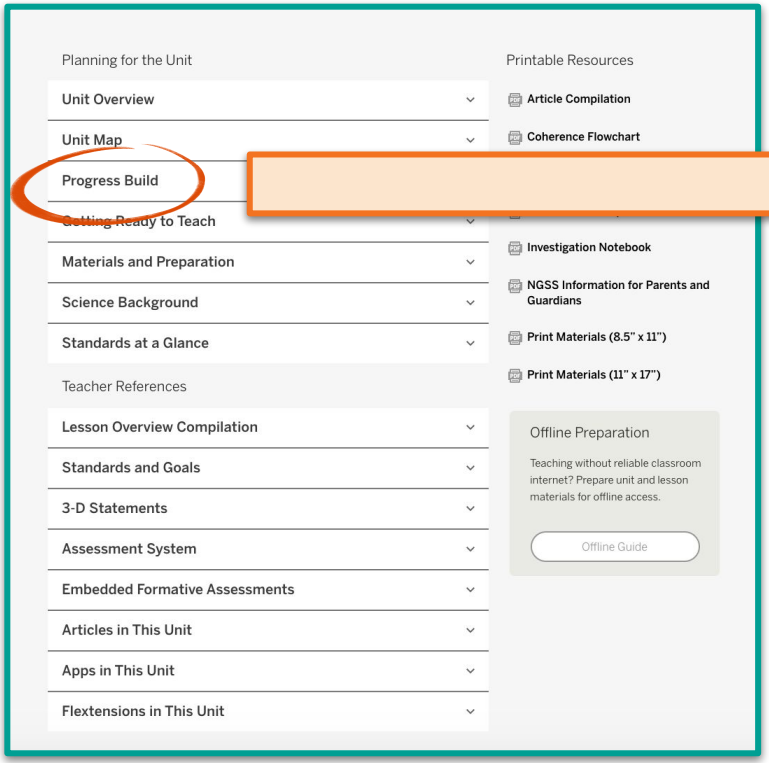
Chapter 4: Could the recreation center's cliff erode quickly?

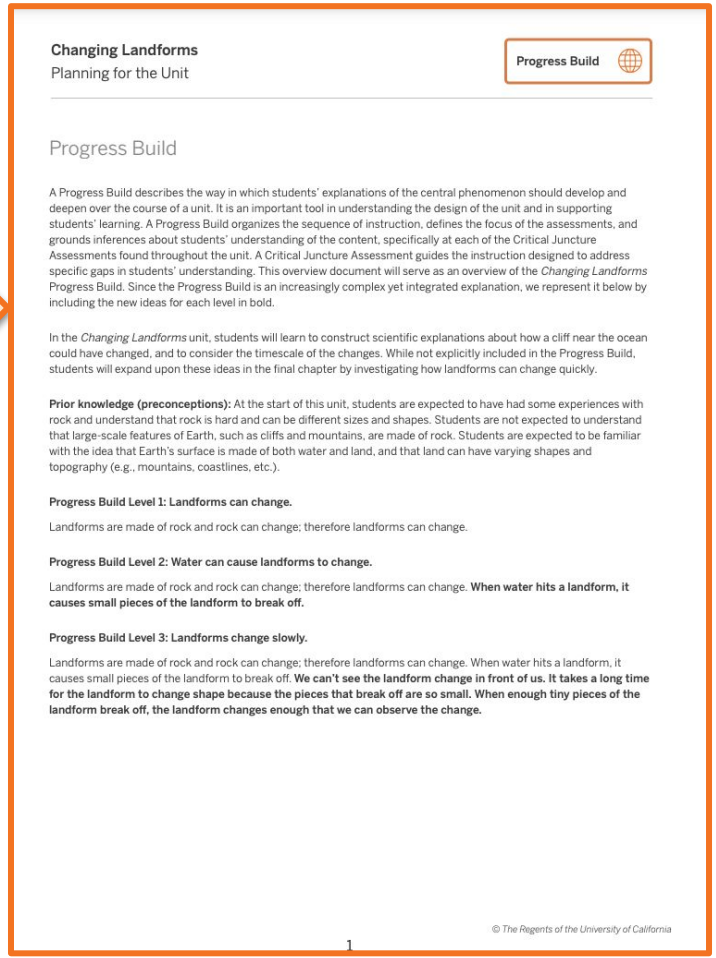
Students figure out: The nearby cliff eroded quickly because it is made of loose materials, such as clay and dirt, which are not as strong as rock. When wind or water hits the cliff, big pieces can break off. This causes the cliff to change more quickly than rock would.

How they figure it out: Students brainstorm and create diagrams of ways they think landforms can erode quickly. Using the reference book, they learn that landforms with cracks and landforms made of loose materials can erode faster than landforms made of solid rock. They use multiple erosion models to provide evidence that supports the idea that wind and water can quickly erode landforms made of loose materials. After reflecting on the many models and information sources from the unit, students use the digital modeling tool to demonstrate their understanding of why landforms made of different materials erode at different rates. Students use newly discovered evidence and key ideas to diagram and write a final explanation of why the nearby cliff eroded overnight. The class then discusses how they should advise the director about the safety of the recreation center's cliff.

	changes to landforms usually take a very long time.	took time for the change to be noticed.
Chapter 4	Students learn that landforms with cracks and landforms made of loose materials can erode faster than landforms made of solid rock.	The nearby cliff eroded quickly because it was made of loose materials like clay and dirt. The center's cliff is made of rock.

Progress Build





Changing Landforms
Planning for the Unit

Progress Build

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 overview document will serve as an overview of the *Changing Landforms* 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 *Changing Landforms* unit, students will learn to construct scientific explanations about how a cliff near the ocean could have changed, and to consider the timescale of the changes. While not explicitly included in the Progress Build, students will expand upon these ideas in the final chapter by investigating how landforms can change quickly.

Prior knowledge (preconceptions): At the start of this unit, students are expected to have had some experiences with rock and understand that rock is hard and can be different sizes and shapes. Students are not expected to understand that large-scale features of Earth, such as cliffs and mountains, are made of rock. Students are expected to be familiar with the idea that Earth's surface is made of both water and land, and that land can have varying shapes and topography (e.g., mountains, coastlines, etc.).

Progress Build Level 1: Landforms can change.

Landforms are made of rock and rock can change; therefore landforms can change.

Progress Build Level 2: Water can cause landforms to change.

Landforms are made of rock and rock can change; therefore landforms can change. **When water hits a landform, it causes small pieces of the landform to break off.**

Progress Build Level 3: Landforms change slowly.

Landforms are made of rock and rock can change; therefore landforms can change. When water hits a landform, it causes small pieces of the landform to break off. **We can't see the landform change in front of us. It takes a long time for the landform to change shape because the pieces that break off are so small. When enough tiny pieces of the landform break off, the landform changes enough that we can observe the change.**

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Page 4

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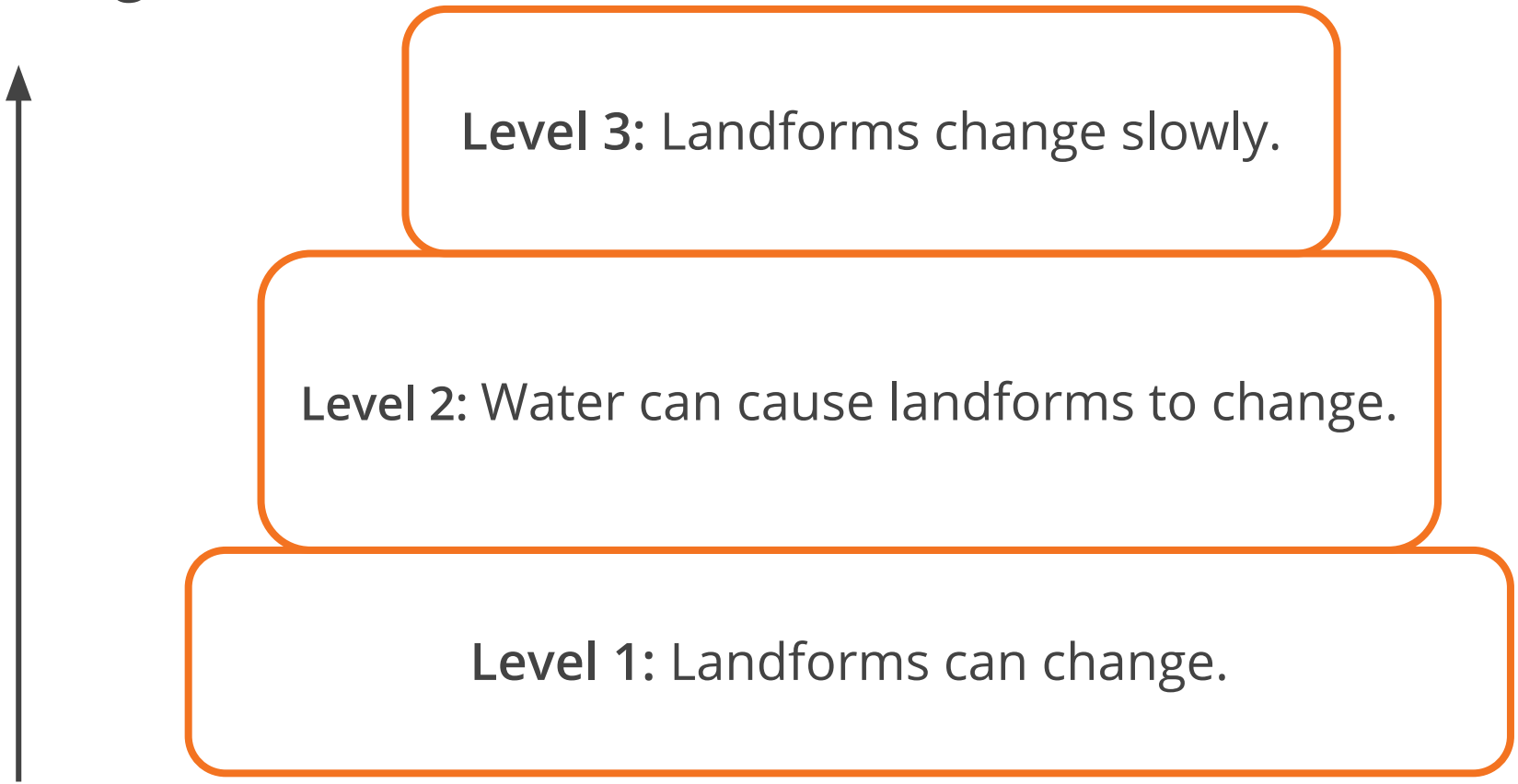
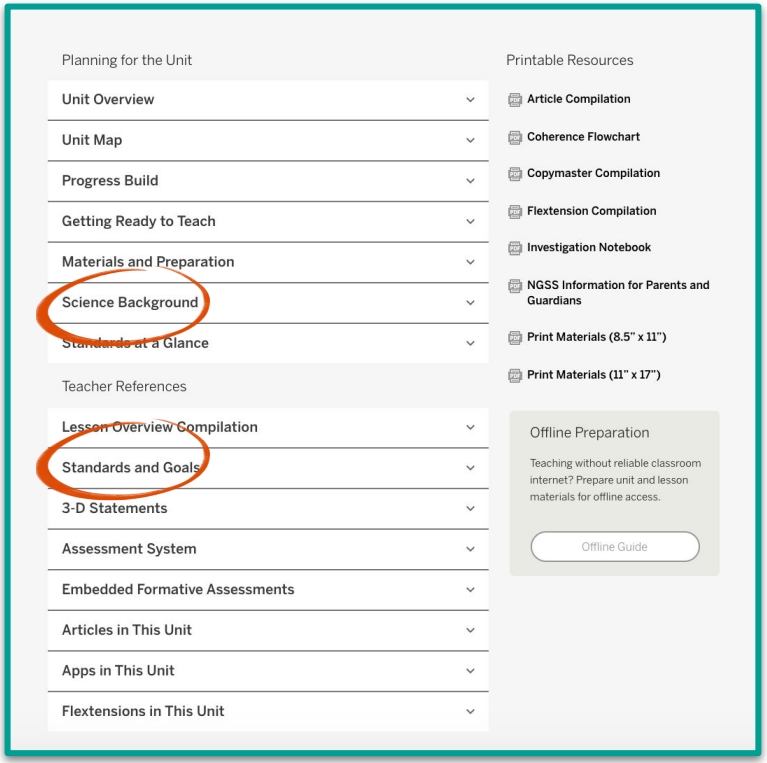
Progress Build



Additional science concept resources for teachers

Science Background:
Adult-level summary of unit science concepts

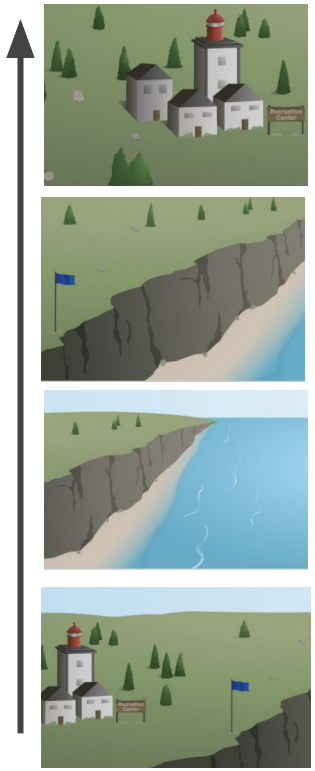
Standards and Goals:
Information about NGSS standards and how they're achieved in the unit



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: Landforms change slowly.

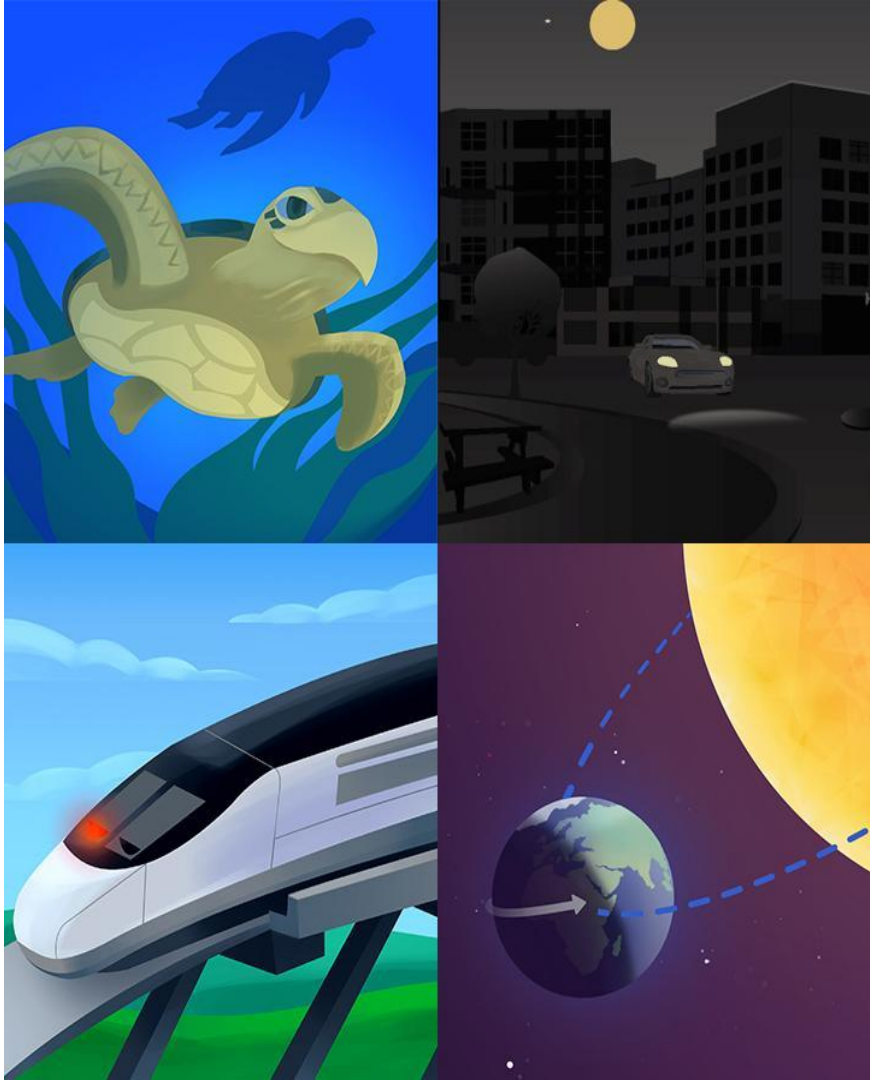
Level 2: Water can cause landforms to change.

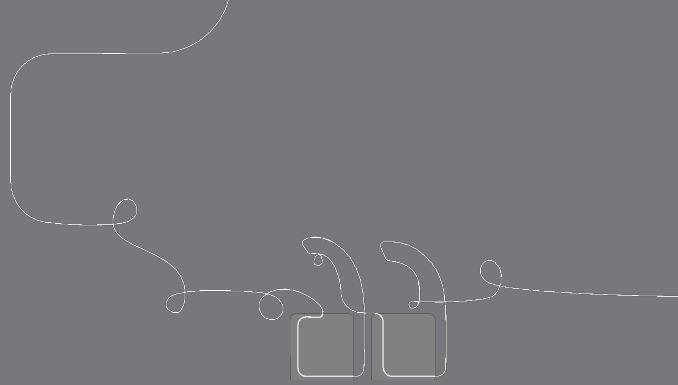
Level 1: Landforms can change.

Reflection

Jamboard

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





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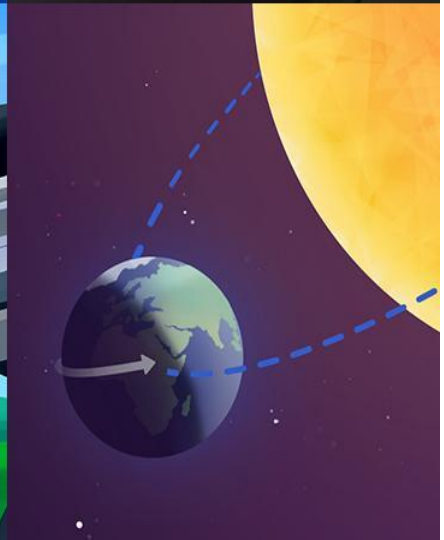

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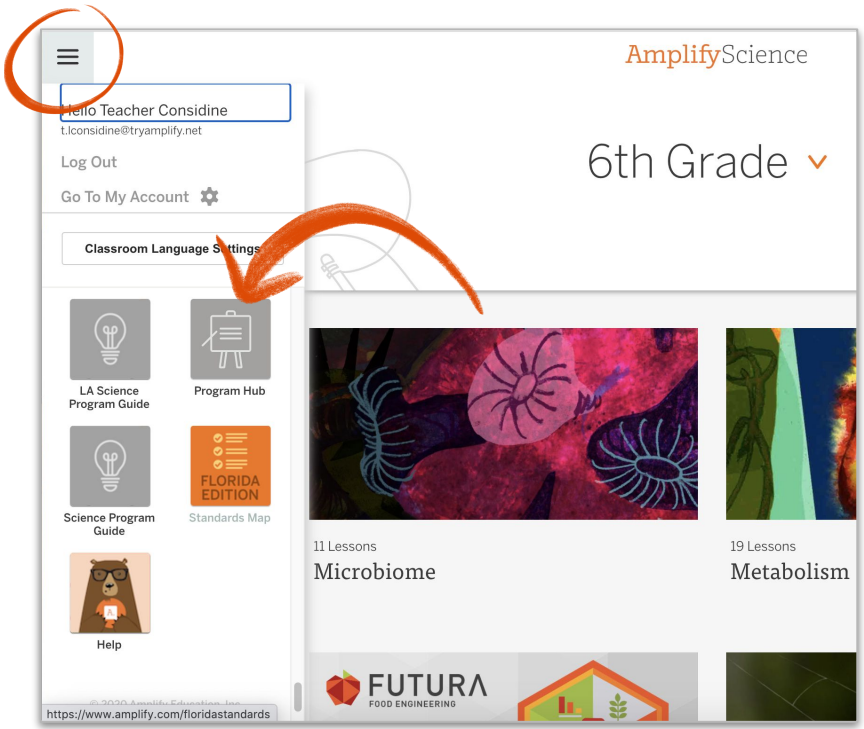
Accessing the Program Hub



Amplify Science@Home resources reference

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

Instructional materials: Click Remote and hybrid learning resources, then select your grade level from the dropdown menu. Select your unit.	
@Home Unit resources: 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.
@Home Video resources: 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.
Additional remote and hybrid instructional materials: 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.
Orientation and Tutorials: 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.	

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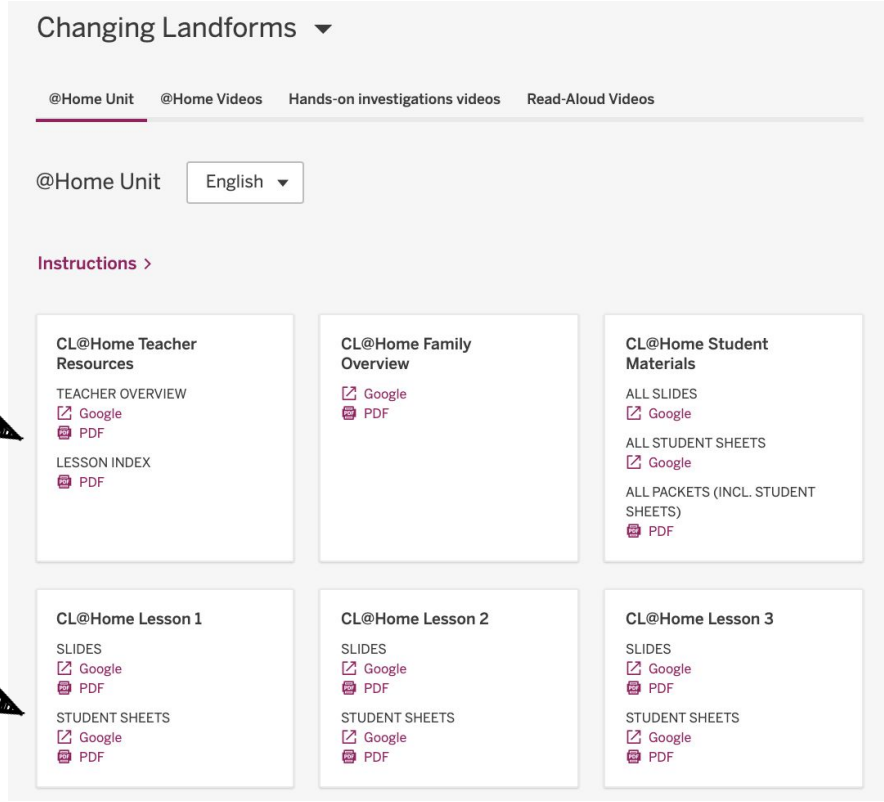
Program Hub work time

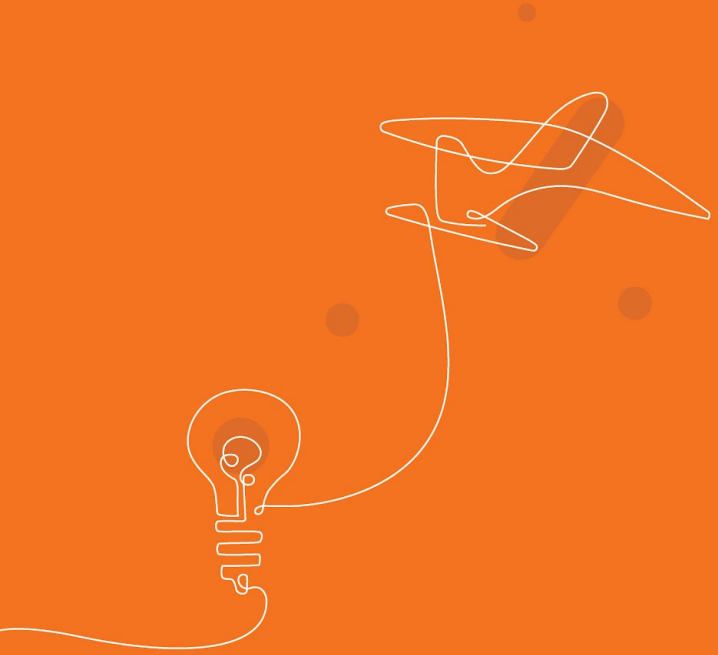
5 minutes

Navigate to the Program Hub. Open:

- Teacher Overview
- Lesson Index
- @Home Lesson 1
  - Slides- Google
  - Student Sheets- Google

If you have extra time, explore the other tabs.





Lesson Walkthrough

Key activities

- **Introducing the Cliff at Oceanside Recreation Center:** Students are introduced to the unit problem and their role as geologists.
- **Write:** Students write explanations about an arch. Their explanations reveal their initial understanding of key unit content.
- **Read:** Students are introduced to the book *Landform Postcards* and explore different types of landforms in the book.

Ideas for synchronous or in-person instruction

While meeting, introduce the students' role as geologists and lead a discussion about what students know about how land changes over time. Have students complete the pre-unit writing after the class meeting. If you are meeting in person, students can work with a partner to read *Landform Postcards*.

@Home Lesson 1

Changing Landforms

AmplifyScience

We’re about to begin a new science unit.

We’ll learn about **changes to the shape of the land**. We’ll use what we learn to help solve a problem.

Unit Question

Why is the shape of the land different than it used to be?

This is **Oceanside Recreation Center**, where students come to learn about leadership and teamwork. The center is on a beautiful **cliff** next to the **ocean**.

When they are at the center, students get to go on **hikes** and **observe nature**. Sometimes they get to stay for a week and sleep in cabins overnight.

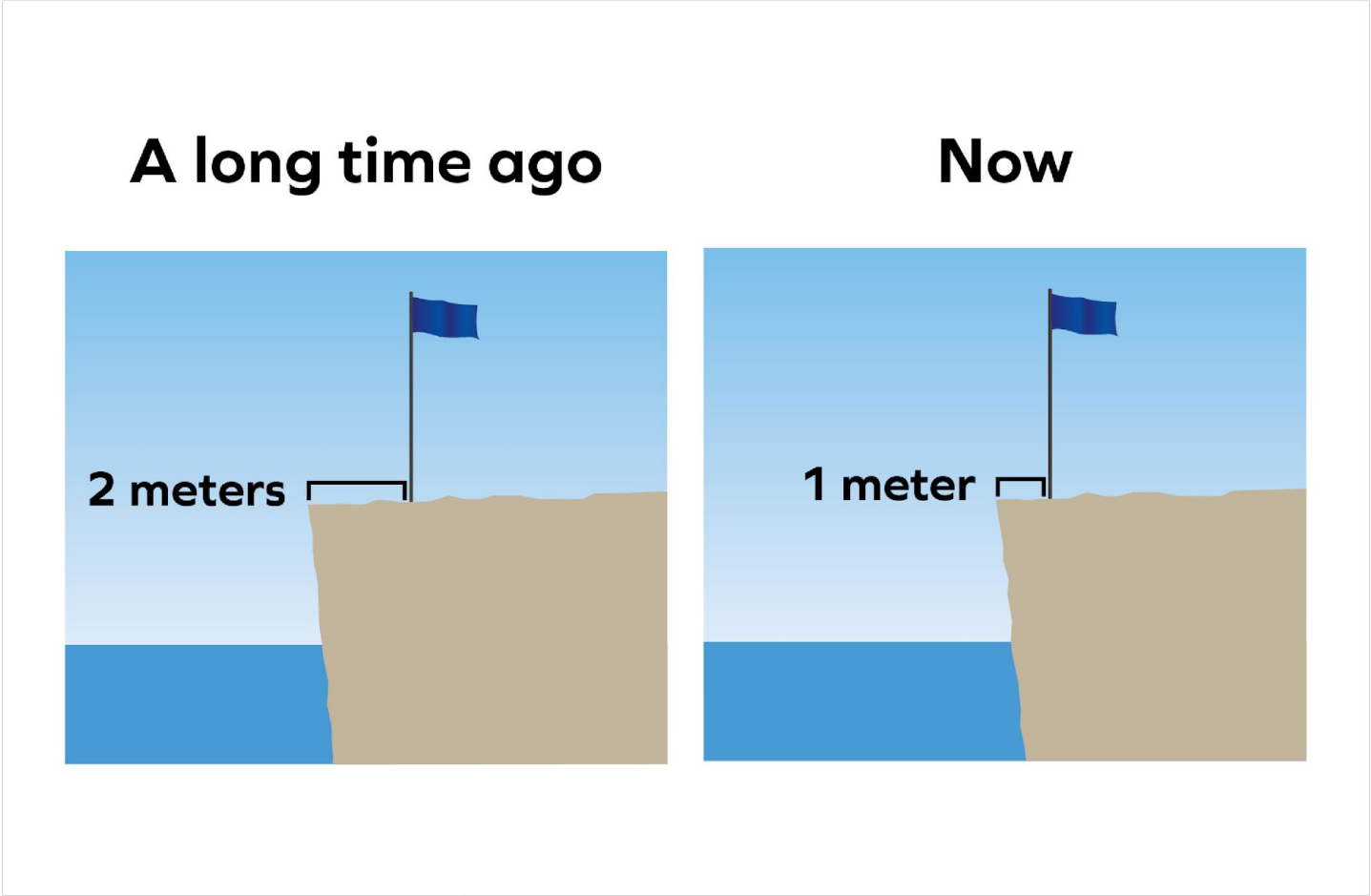
Nearby Cliff

Director Higgins at Oceanside found out that a nearby cliff **collapsed**. He is worried this might happen to the recreation center's cliff, putting visitors at risk.

After researching the recreation center's cliff, Director Higgins found some important information.

He found that the edge of the cliff is closer to the flagpole than it used to be.

Look at the diagram on the next slide.


A long time ago
2 meters
Now
1 meter

The cliff seems to be changing—maybe even disappearing! It is not as stable as Director Higgins once thought.

Director Higgins is worried the cliff might collapse like the nearby cliff.

Chapter 1 Question

How did the edge of the cliff get to be so close to the flagpole?

Director Higgins has hired us as **geologists** to help decide whether the recreation center's cliff is safe.

As geologists, our role is to help Director Higgins decide if he needs to close the recreation center because visitors are in danger.

This is a word we'll use during this unit.

geologist

a scientist who studies the solid part of Earth

Key activities

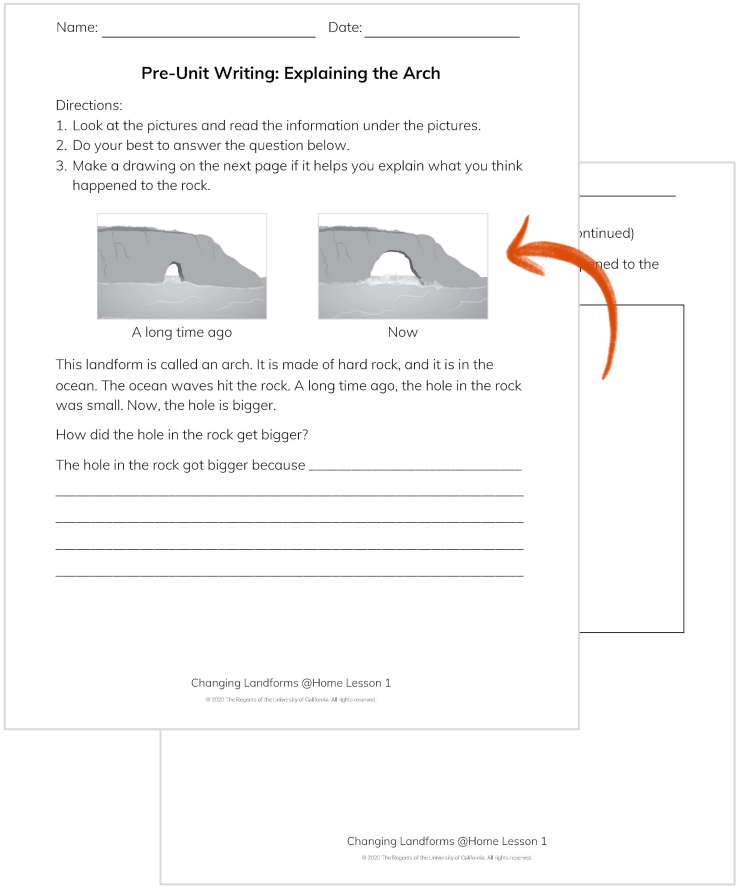
- **Introducing the Cliff at Oceanside Recreation Center:** Students are introduced to the unit problem and their role as geologists.
- **Write:** Students write explanations about an arch. Their explanations reveal their initial understanding of key unit content.
- **Read:** Students are introduced to the book *Landform Postcards* and explore different types of landforms in the book.

Ideas for synchronous or in-person instruction

While meeting, introduce the students' role as geologists and lead a discussion about what students know about how land changes over time. Have students complete the pre-unit writing after the class meeting. If you are meeting in person, students can work with a partner to read *Landform Postcards*.

You'll start by **writing your ideas** about a different landform called an **arch**.

This is a chance for you to write your first ideas about **how landforms change**. Don't worry about whether your ideas are correct or incorrect.


Name: _____ Date: _____

Pre-Unit Writing: Explaining the Arch

Directions:
1. Look at the pictures and read the information under the pictures.
2. Do your best to answer the question below.
3. Make a drawing on the next page if it helps you explain what you think happened to the rock.

A long time ago

Now

This landform is called an arch. It is made of hard rock, and it is in the ocean. The ocean waves hit the rock. A long time ago, the hole in the rock was small. Now, the hole is bigger.

How did the hole in the rock get bigger?

The hole in the rock got bigger because _____

Changing Landforms @Home Lesson 1

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Changing Landforms @Home Lesson 1

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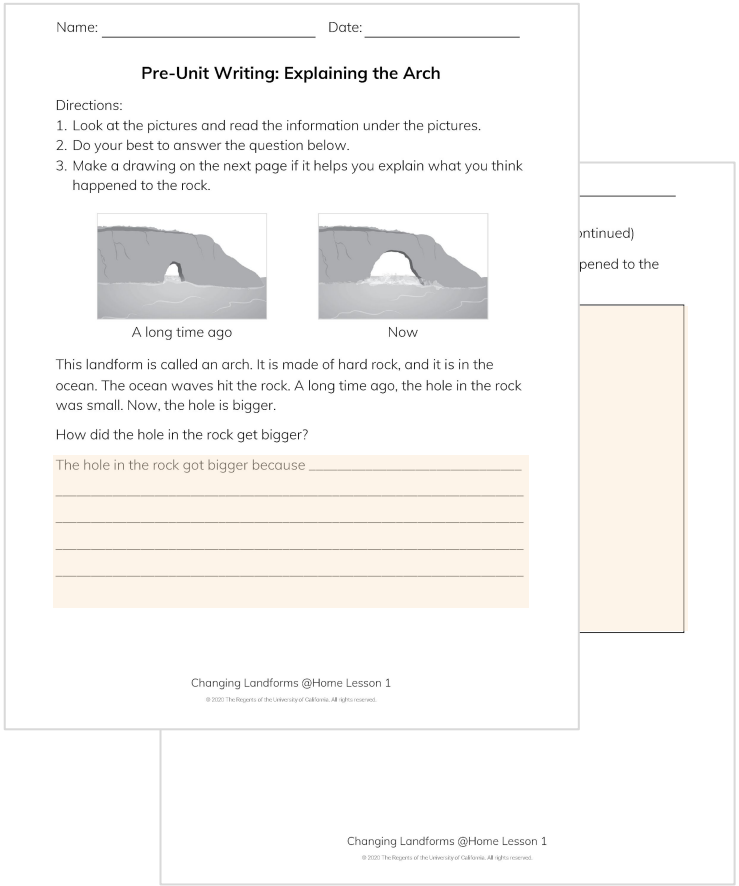
Find the Pre-unit Writing: Explaining the Arch pages.

Look carefully at the **drawings** of the arch. **Read** what it says below the drawings.



Name: _____ Date: _____

Pre-Unit Writing: Explaining the Arch

Directions:
1. Look at the pictures and read the information under the pictures.
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A long time ago

Now

This landform is called an arch. It is made of hard rock, and it is in the ocean. The ocean waves hit the rock. A long time ago, the hole in the rock was small. Now, the hole is bigger.

How did the hole in the rock get bigger?

The hole in the rock got bigger because _____

Changing Landforms @Home Lesson 1

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Changing Landforms @Home Lesson 1

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Write your answer to the question on the first page. Make a **drawing** on the second page if it helps you explain your thinking.

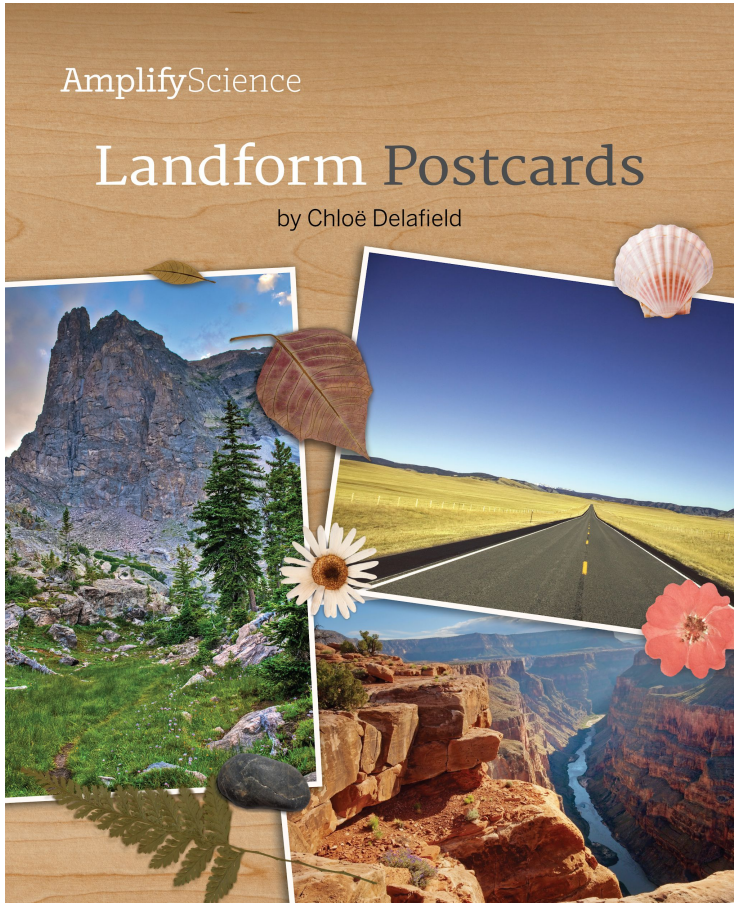
Key activities

- **Introducing the Cliff at Oceanside Recreation Center:** Students are introduced to the unit problem and their role as geologists.
- **Write:** Students write explanations about an arch. Their explanations reveal their initial understanding of key unit content.
- **Read:** Students are introduced to the book *Landform Postcards* and explore different types of landforms in the book.

Ideas for synchronous or in-person instruction

While meeting, introduce the students' role as geologists and lead a discussion about what students know about how land changes over time. Have students complete the pre-unit writing after the class meeting. If you are meeting in person, students can work with a partner to read *Landform Postcards*.

Next you will read a book. Check with your teacher about how you will access books in this @Home Unit.



We'll use this book to learn more about **landforms**.

Using the digital library? Find the book at tinyurl.com/AMPCL-52
Watching a read-aloud video? Find the video at tinyurl.com/AMPCL-01

About Landforms

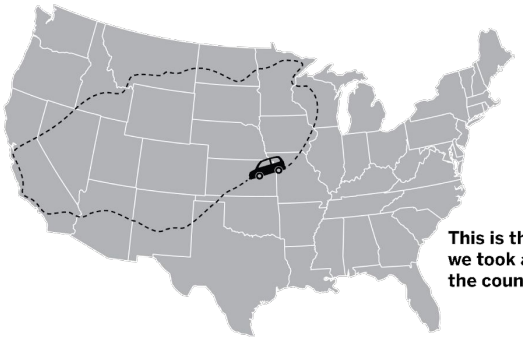
Hi, my name is Annie. This book is about a road trip I took this summer. We drove across the United States. My grandpa is a **geologist**. He taught me about **landforms**. Landforms are parts of Earth's **surface** like mountains, valleys, and cliffs. Grandpa thought it would be fun for me to **observe** landforms around the country. I sent him postcards of what I saw.

Here are some things Grandpa taught me about landforms: Anywhere you go on Earth, you will see landforms. Unless you are reading this book in the middle of the ocean, you can probably find a landform near you. Even in a city, you can find landforms.

This picture has lots of different landforms. It has a beach, an island, a peninsula, and some hills.

Here we are about to leave on our trip. That's me in the middle and my little sister on the right.

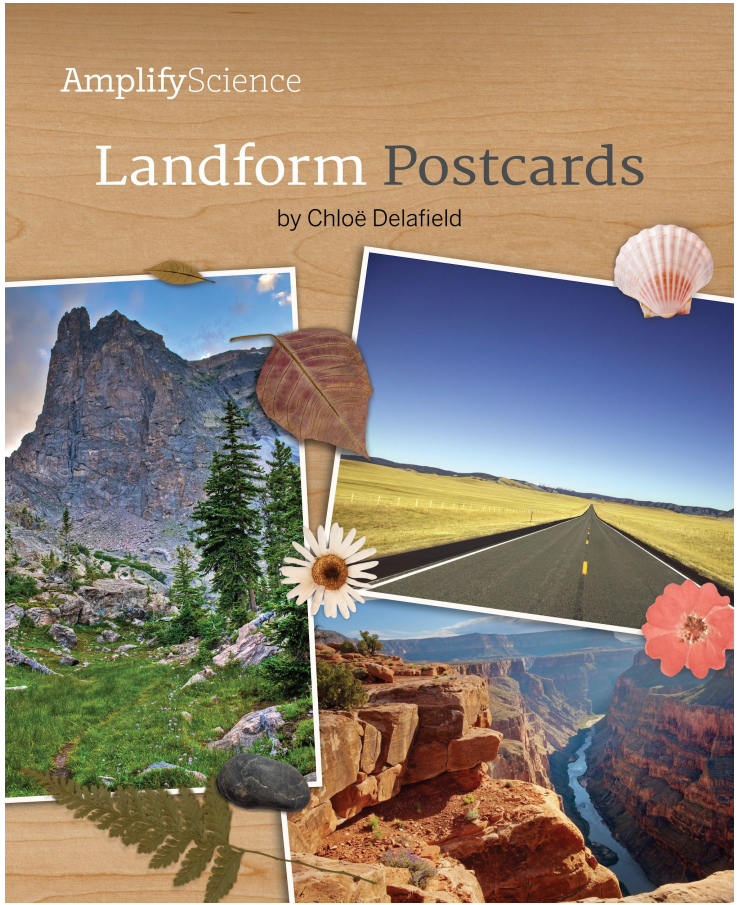
Grandpa also taught me that landforms are made of rock. They can have other things on top, like sand, dirt, or even ice. Some landforms may be common where you live. Others may only be found far away. Keep reading to find out what landforms I saw on my trip!



This is the route we took around the country.

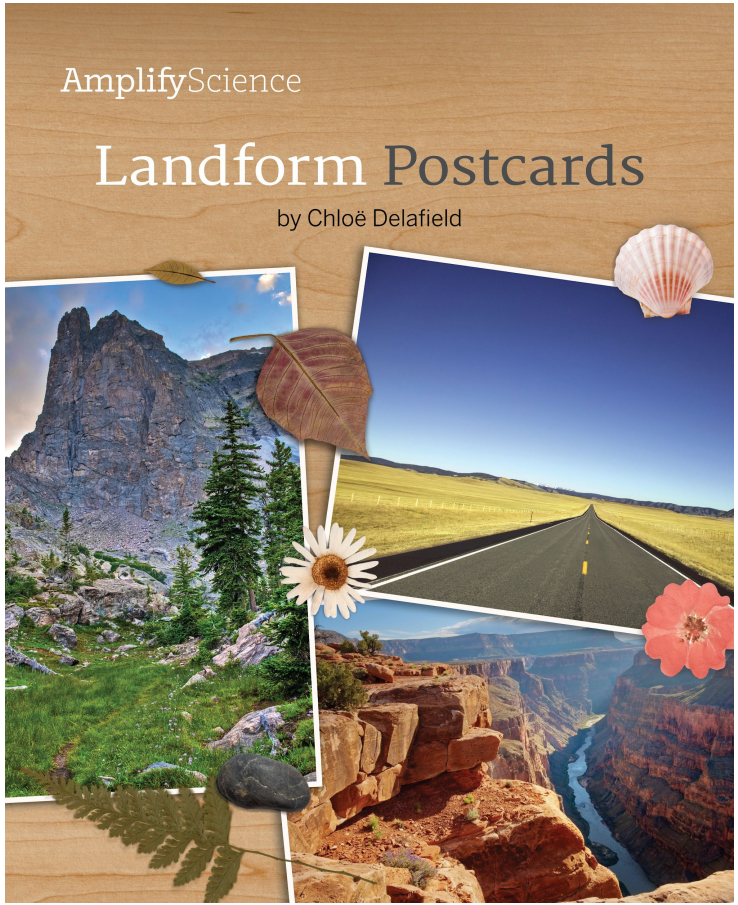
Let's start by reading the first section, **About Landforms.**

Read pages 4 and 5.



Now you'll explore the rest of the book about different landforms.

Look through the whole book. Look at the pictures and read the names of the landforms.



Are any of these **landforms** familiar? Have you visited or seen pictures of any of them?

Contents

Page 3 is the Contents that lists all the landforms in the book.

Choose one landform in the book you want to read about. **Read** the two pages for that landform.

This is an important word we'll use in this unit.

landform

a feature of Earth's surface,
such as a mountain, a cliff, or a valley

End of @Home Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Amplify.

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Adapted from: Amplify Science *Changing Landforms* Lesson 1.1

Key activities

- **Introducing the Cliff at Oceanside Recreation Center:** Students are introduced to the unit problem and their role as geologists.
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- **Read:** Students are introduced to the book *Landform Postcards* and explore different types of landforms in the book.

Ideas for synchronous or in-person instruction

While meeting, introduce the students' role as geologists and lead a discussion about what students know about how land changes over time. Have students complete the pre-unit writing after the class meeting. If you are meeting in person, students can work with a partner to read *Landform Postcards*.

Suggestions for Online Synchronous Time

Online synchronous time

Online discussions: It's worthwhile to establish norms and routines for online discussions in science to ensure equity of voice, turn-taking, etc.

Digital tool demonstrations: You can share your screen and demonstrate, or invite your students to share their screen and think-aloud as they use a Simulation or other digital tool.

Interactive read-alouds: Screen share a digital book or article, and pause to ask questions and invite discussion as you would in the classroom.

Shared Writing: This is a great opportunity for a collaborative document that all your students can contribute to.

Co-constructed class charts: You can create digital charts, or create physical charts in your home with student input.

page 8

Questioning Strategies

Pages 9-10

- Questions to assess students' knowledge and skills
- Questions to promote student-to-student discourse
- Questions to guide student learning

Questioning Strategies for Grades 2–5

Overview of the Role of Open-Ended Questioning

Repeated opportunities for students to listen to and speak with others are essential for promoting deep thinking and learning in science. Meaningful teacher-initiated questions create a rich context for promoting open-ended student dialogue and discussion. The *Science Framework for California Public Schools* explains that "Simply providing opportunities to talk is not enough. Effective questioning can scaffold student thinking" (*California Science Framework*, 2016, Chapter 11, p. 21). The Framework suggests that "Teacher-initiated questions are key to helping students expand their communication, reasoning, arguments, and representation of ideas in science" (*California Science Framework*, 2016, Chapter 11, p. 21). The types of questions that teachers pose are instrumental in supporting student understanding. The Framework calls for more open-ended teacher questioning that "prompts and facilitates students' discourse and thinking" and less teacher questioning that prompts "students to seek a confirmatory right answer" (*California Science Framework*, 2016, Chapter 11, p. 6).

The Amplify Science Teacher's Guide is infused with opportunities for students to discuss their developing ideas in response to open-ended prompts. Questions to promote student thinking and discussion are purposefully built into the Teacher's Guide instructional steps and Teacher Support notes that surround all our hands-on and reading activities. In addition, all units include discourse routines (e.g., Shared Listening, Think-Draw-Pair-Share, Write and Share, Word Relationships) that provide opportunities for students to use focal unit vocabulary as they think and talk with partners and the class about their understanding of key science content and practices. Many of the On-the-Fly Assessment suggestions provided throughout each unit offer open-ended follow-up questions that can be used to probe student thinking and formatively assess student understanding of the content. In addition, each unit includes multiple opportunities for students to respond to open-ended questions through additional modalities (e.g., in writing, with diagrams, through a kinesthetic model).

While the prompts embedded in each of the opportunities mentioned above provide fertile ground for student discussion, continued use of flexible, open-ended questions is invaluable for assessing students' knowledge and skills, promoting student-to-student discourse, and guiding student learning. A collection of grade-appropriate questions follows that can be used for these purposes. You will also find a list of activity types included within the Amplify Science curriculum that are particularly conducive to the use of these questions. You may choose to print out these questions and activity types for reference throughout your instruction.

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- Discussion of photographs and videos
- Discourse routines (e.g., Thought Swap, Think-Draw-Pair-Share)
- Science Practice Tool activities (modeling, sorting, graphing, diagramming, data)
- Simulation activities (grades 4–5)
- Evidence Card sorts
- Evidence Circles
- Roundtable Discussions

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Hands-on Suggestions

Grade 2 **Unit:** Changing Landforms [Hands-On Investigation Video Playlist]

Lesson	Activity	@Home Lesson	Activity Description	Suggested Modality	Reasoning	Teacher/Student Provided Materials	Consumable Materials	Non-Consumable Materials	LAUSD Replacement Materials
1.3	Observing Sand Samples	3	Students compare sand samples, noting similarities and differences in properties such as size and color	hands-on	Students do observations just as scientists do to compare things to help them answer their questions. (If sand types are not available, use the hands on video)	glue, index cards (4 per student)	4 baggies per student labeled Sand 1, Sand 2, Sand 3, and Sand 4 with 4 different types of sand. (jagged black, jagged tan, large rounded multi-colored, fine playground)	hand lens 1 per student (teacher provided)	4 baggies per student labeled Sand 1, Sand 2, Sand 3, and Sand 4 with 4 different types of sand. (jagged black, jagged tan, large rounded multi-colored, fine playground)
1.6	Explaining Landform Changes	5	Students will gather evidence that sand can change shape.	hands-on	Students shake the cup with candy to visualize processes they cannot observe. The candy represents a grain of sand.	hard candy, plastic cup covered with plastic wrap			
2.2	Modeling Landform Changes	6	Students spray chalk with water to explore how water can change landforms	hands-on	This could be assigned as a hands-on activity or students can observe the video demonstration.	plastic container, water	chalk	hand lens 1 per student (teacher provided)	chalk piece per student
2.5	Scale of Erosion	8	Students rub two pumice rocks together and observe what happens. This helps students visualize the small scale of the pieces that erode from landforms.	watch video	There are only 18 pumice rocks in the kit. In order for students to do this at home, you would need 2 pumice rocks per student.				
3.2	Investigating Differences in Scale	11	Students model erosion by removing pom poms from the mountain until a change is noticeable.	watch video	This is a class model. (The kit has only enough to create one model.) It could be done as a hands on if students were to each create a model with a bag of pom poms.			bag of pom poms per student if it is done as hands on.	bag of pom poms per student if it is done as hands on.
4.2	Modeling How Landforms Erode Quickly	15	Students investigate the chalk model and sand model. They compare the models and note how the sand eroded more quickly.	watch video	Students would need spray bottles, kinetic sand, chunk of chalk and safety goggles to do this at home. It would be difficult for a teacher to monitor all students remotely.				

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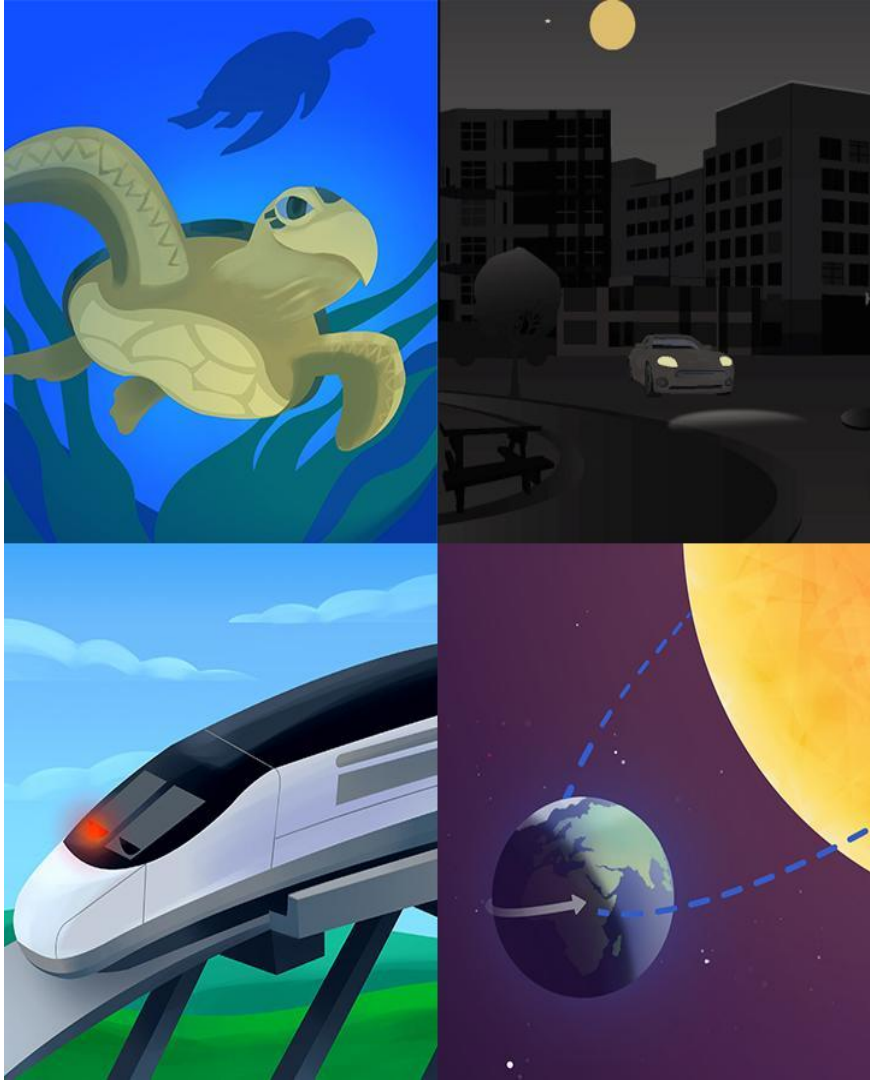
Reflection

Jamboard

How would you teach this lesson?
How might you include suggestions for online synchronous time and/or questioning strategies?



Multi-day planning, including planning for differentiation and evidence of student work

Day @Home Lesson 1

Minutes for science: 30 min.

Instructional format:
- ❑ Asynchronous
- ☒ Synchronous

Lesson or part of lesson:
Introduce, student role (geologist) and unit context (slides 1-15)

Mode of instruction:
- ❑ Preview
- ❑ Review
- ☒ Teach full lesson live
- ❑ Teach using synchronous suggestions
- ❑ Students work independently using:
  - ❑ Printed @Home Slides
  - ❑ Digital @Home Slides
  - ❑ @Home Videos

Students will...	Teacher will...
View slides and learn about the unit problem and their role as geologists. Students will do the pre writing assessment about landform arches.	Introduce the unit question and chapter question. Walk students through slides and assign google sheets for lesson 1 through schoology.

Minutes for science: _____

Instructional format:
- ❑ Asynchronous
- ❑ Synchronous

Lesson or part of lesson:

Mode of instruction:
- ❑ Preview
- ❑ Review
- ❑ Teach full lesson live
- ❑ Teach using synchronous suggestions
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Students will...	Teacher will...

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- ☒ Synchronous

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Introduce student role (geologist) and unit context (slides 1-15)

Mode of instruction:
- ☐ Preview
- ☐ Review
- ☒ Teach full lesson live
- ☐ Teach using synchronous suggestions
- ☐ Students work independently using:
  - ☐ Printed @Home Slides
  - ☐ Digital @Home Slides
  - ☐ @Home Videos

Students will...	Teacher will...
View slides and learn about the unit problem and their role as geologists. Students will do the pre writing assessment about landform arches.	Introduce the unit question and chapter question. Walk students through slides and assign google sheets for lesson 1 through schoology.

Minutes for science: 20 min

Instructional format:
- ☒ Asynchronous
- ☐ Synchronous

Lesson or part of lesson:
Students will watch the @Home video read aloud of Landform Postcards

Mode of instruction:
- ☐ Preview
- ☐ Review
- ☐ Teach full lesson live
- ☐ Teach using synchronous suggestions
- ☒ Students work independently using:
  - ☐ Printed @Home Slides
  - ☒ Digital @Home Slides
  - ☐ @Home Videos

Students will...	Teacher will...
Students will view video of Landform postcards. (Read aloud video) Students will answer the 2 questions posed by the teacher.	Assign read aloud video of Landform Postcards to students in schoology. Assign students in schoology to answer these questions: Do you recognize any of these landforms? Have you visited or seen pictures of any of them?

Look at the *Students will* columns. What are students working in the lesson(s) that you could collect, review, or provide feedback on?
See Some Types of Written Work in Amplify Science to the right for guidance.

If there isn't a work product listed above, do you want to add one? Make notes below.

Synchronous: students will complete the pre-assessment

Asynchronous: students will use a schoology discussion board or jamboard to answer questions about the reading, "Landform Postcards"

How will students submit this work product to you?
See the Completing and Submitting Written Work tables to the right for guidance on how students can complete and submit work.

Synchronous: students will submit their pre unit assessment through schoology or kami

Asynchronous: Students will watch the "Read Aloud" video of Landform postcards and provide responses to questions through Jamboard or Kami..

Some Types of Written Work in Amplify Science

- Daily written reflections
- Homework tasks
- Investigation notebook pages
- Written explanations (typically at the end of Chapter)
- Diagrams
- Recording pages for Sim uses, investigations, etc

Completing Written Work	Submitting Written Work
• Plain paper and pencil (videos include prompts for setup) • (6-8) Student platform • Investigation Notebook • Record video or audio file describing work/answering prompt • Teacher-created digital format (Google Classroom, etc)	• Take a picture with a smartphone and email or text to teacher • Through teacher-created digital format • During in-school time (hybrid model) or lunch/materials pick-up times • (6-8) Hand-in button on student platform

How will you differentiate this lesson for diverse learners? (Navigate to the lesson level on the standard Amplify Science platform and click on differentiation in the left menu.)

Look at the *Students will* columns. What are students working in the lesson(s) that you could collect, review, or provide feedback on?
See Some Types of Written Work in Amplify Science to the right for guidance.

If there isn't a work product listed above, do you want to add one? Make notes below.

Asynchronous: students jot down their initial ideas

Synchronous: record observations of dolphin sounds.

Some Types of Written Work in Amplify Science

- Daily written reflections
- Homework tasks
- Investigation notebook pages
- Written explanations (typically at the end of Chapter)
- Diagrams
- Recording pages for Sim uses, investigations, etc

How will students submit this work product to you?
See the Completing and Submitting Written Work tables to the right for guidance on how students can complete and submit work.

Asynchronous: students jot initial ideas on paper or digitally to bring with them to the asynchronous lesson

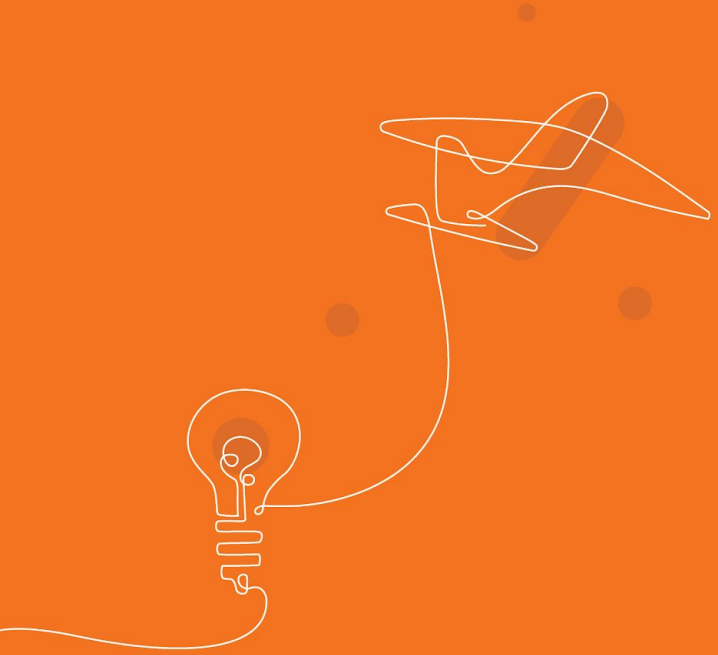
Synchronous: Students will use the student sheets to record their observations and complete the pre unit assessment and submit through Schoology.

Completing Written Work	Submitting Written Work
• Plain paper and pencil (videos include prompts for setup) • (6-8) Student platform • Investigation Notebook • Record video or audio file describing work/answering prompt • Teacher-created digital format (Google Classroom, etc)	• Take a picture with a smartphone and email or text to teacher • Through teacher-created digital format • During in-school time (hybrid model) or lunch/materials pick-up times • (6-8) Hand-in button on student platform

How will you differentiate this lesson for diverse learners? (Navigate to the lesson level on the standard Amplify Science platform and click on differentiation in the left menu.)

Supports:

- Encourage students to engage in student-to-student discussion
- Provide alternate means of expressing ideas (drawings, discussion boards, etc.)
- Provide students with the Multi-Language Glossary where appropriate, add images
- Leverage primary language for discussions
- Strategic grouping
- Visual representations
- Clarify multiple meaning words in reading



Collaborative Planning

Breakout groups

pages 13-16

Discussion prompts

Planning:

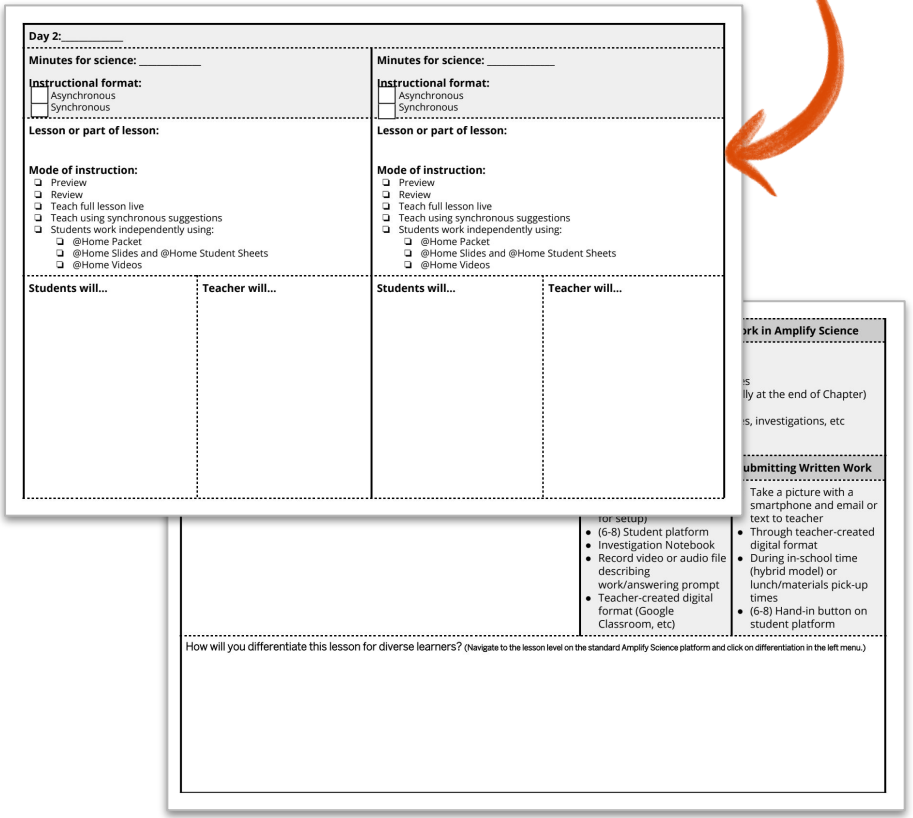
- Dig into the @Home Resources for your assigned lesson.

Student work:

- Discuss how you can collect evidence of student work

Differentiation:

- Consider how you might differentiate your lesson



Day 2:_____

Minutes for science: _____ Instructional format: ☐ Asynchronous ☐ Synchronous	Minutes for science: _____ Instructional format: ☐ Asynchronous ☐ Synchronous
Lesson or part of lesson: Mode of instruction: ❑ Preview ❑ Review ❑ Teach full lesson live ❑ Teach using synchronous suggestions ❑ Students work independently using: ❑ @Home Packet ❑ @Home Slides and @Home Student Sheets ❑ @Home Videos	Lesson or part of lesson: Mode of instruction: ❑ Preview ❑ Review ❑ Teach full lesson live ❑ Teach using synchronous suggestions ❑ Students work independently using: ❑ @Home Packet ❑ @Home Slides and @Home Student Sheets ❑ @Home Videos

Students will...	Teacher will...	Students will...	Teacher will...

rk in Amplify Science

lly at the end of Chapter)

s, investigations, etc

ubmitting Written Work

- Take a picture with a smartphone and email or text to teacher
- Through teacher-created digital format
- During in-school time (hybrid model) or lunch/materials pick-up times
- (6-8) Hand-in button on student platform

for setup)
- (6-8) Student platform
- Investigation Notebook
- Record video or audio file describing work/answering prompt
- Teacher-created digital format (Google Classroom, etc)

How will you differentiate this lesson for diverse learners? (Navigate to the lesson level on the standard Amplify Science platform and click on differentiation in the left menu.)

Breakout groups

pages 13-16

Please choose a person from your group to share out!

Planning:

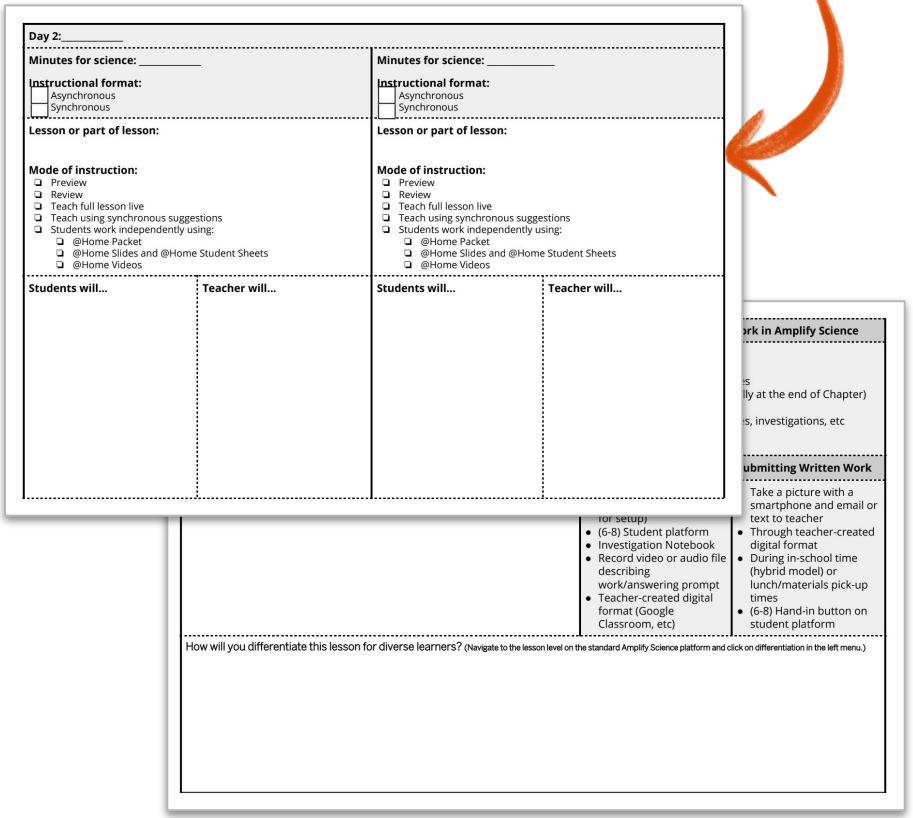
- What did you will prioritize for synchronous vs. asynchronous time?

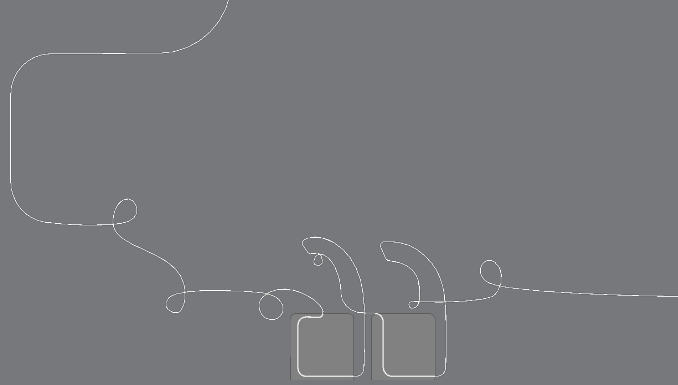
Student work:

- How do you plan to collect evidence of student work?

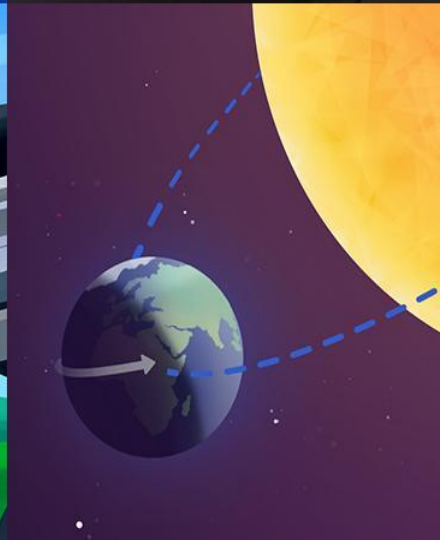
Differentiation:

- How do you plan to differentiate the lesson for diverse learners?





Questions?

Plan for the day

- **Framing the day**
  - Remote learning reflection
  - Revisiting the Amplify Approach
- **Phenomenon at the unit level**
  - Navigation refresher (standard curriculum)
  - Storyline and science concepts
  - Unit internalization work time
- **Planning to teach**
  - Navigation refresher (@Home resources)
  - Lesson walkthrough
  - Collaborative planning time
- **Closing**
  - Reflection & survey

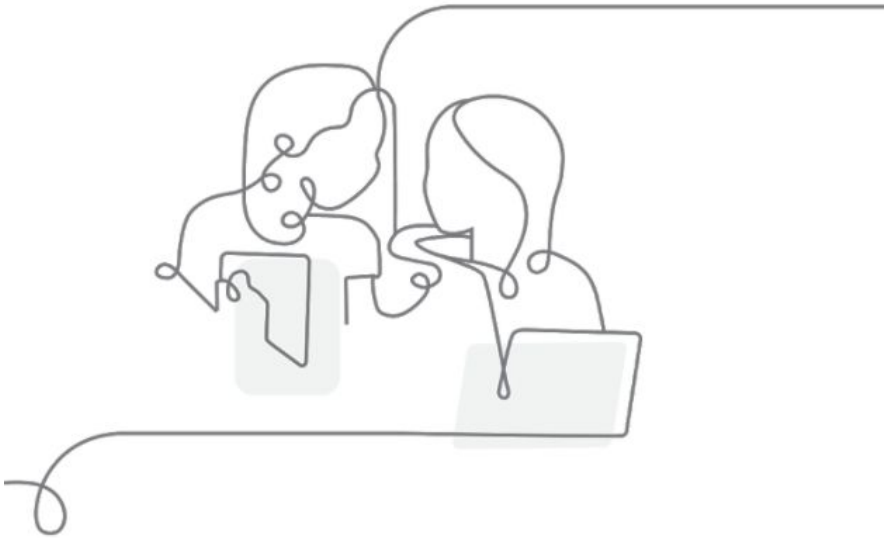
Head or hands reflection

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?
- Make a plan for implementing Amplify Science within your class schedule and instructional format?

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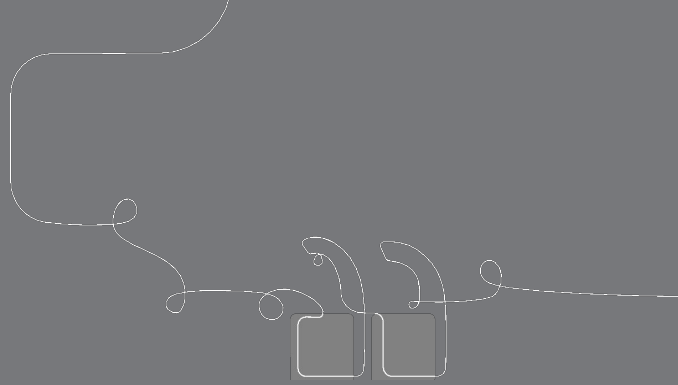
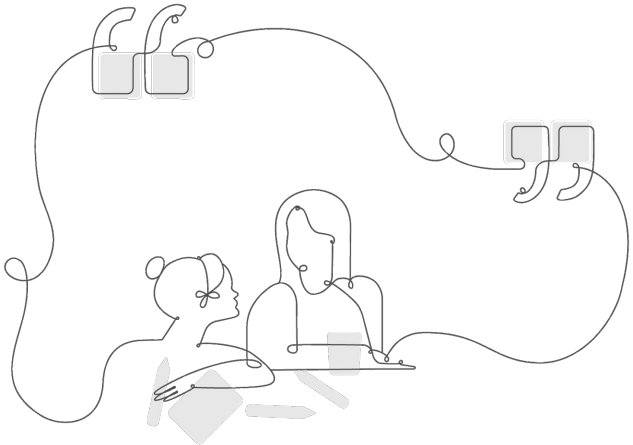


Final questions?

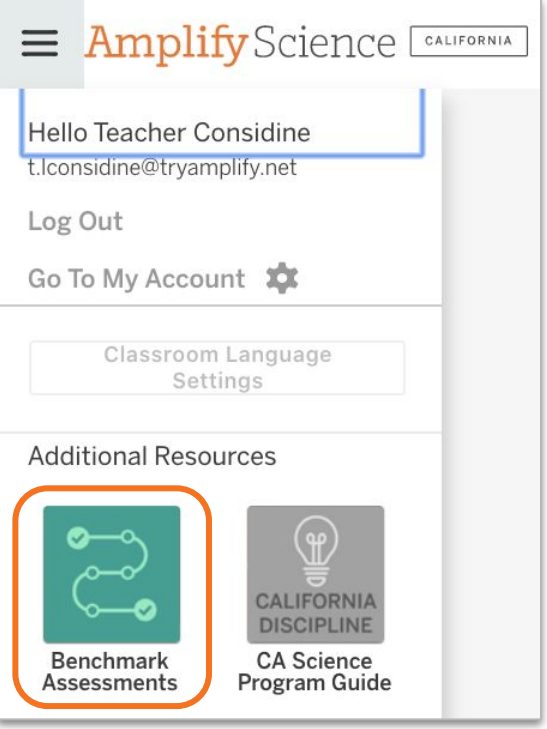
Upcoming LAUSD Office Hours

Twice Monthly on Thursdays, 4:30-5:30pm:

- April 8
- April 22
- May 13
- May 27



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



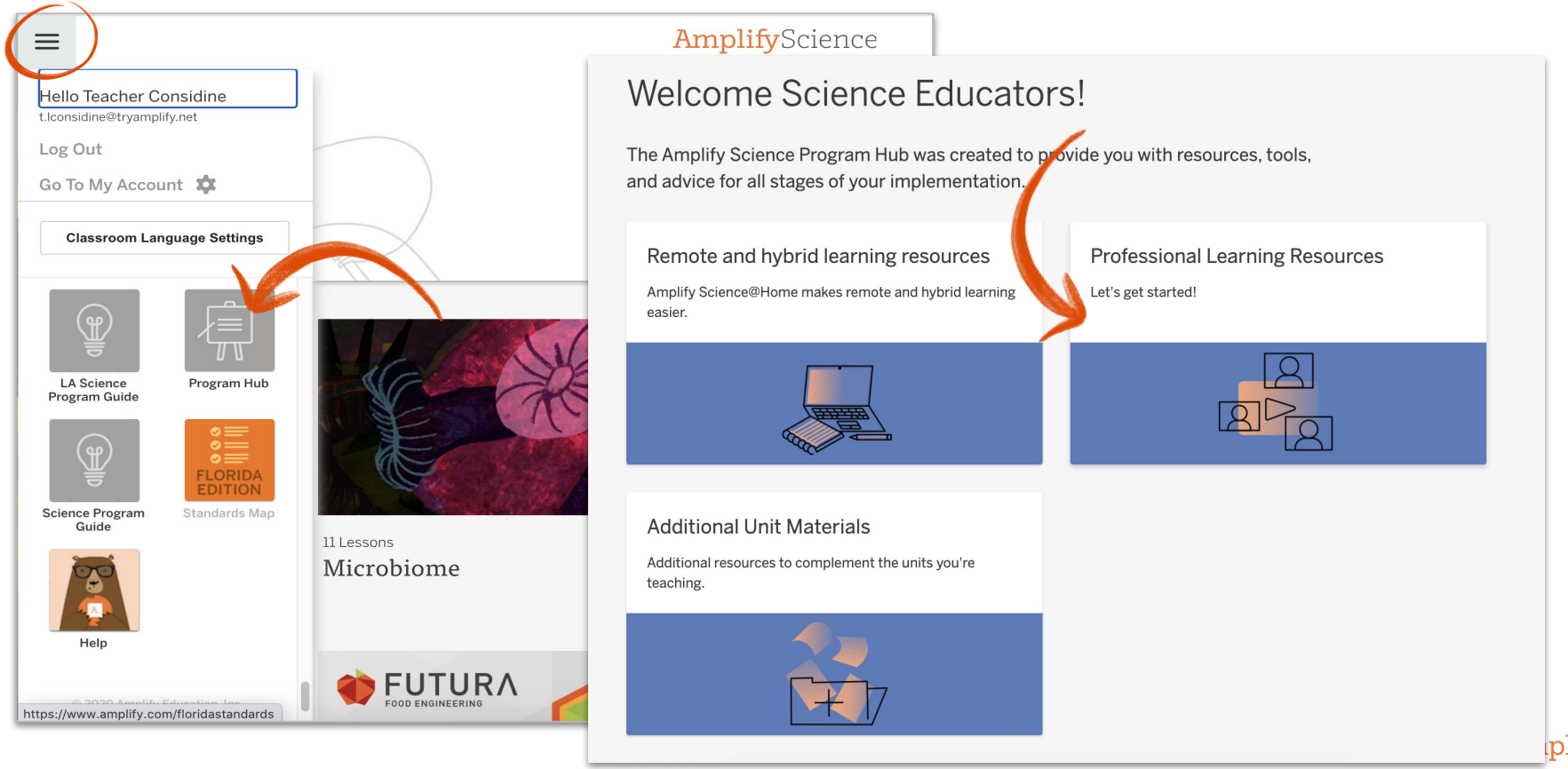
Benchmark Assessments

In conjunction with Amplify Science, teachers can administer benchmark assessments to evaluate students' progress toward meeting Next Generation Science Standards several times each school year.

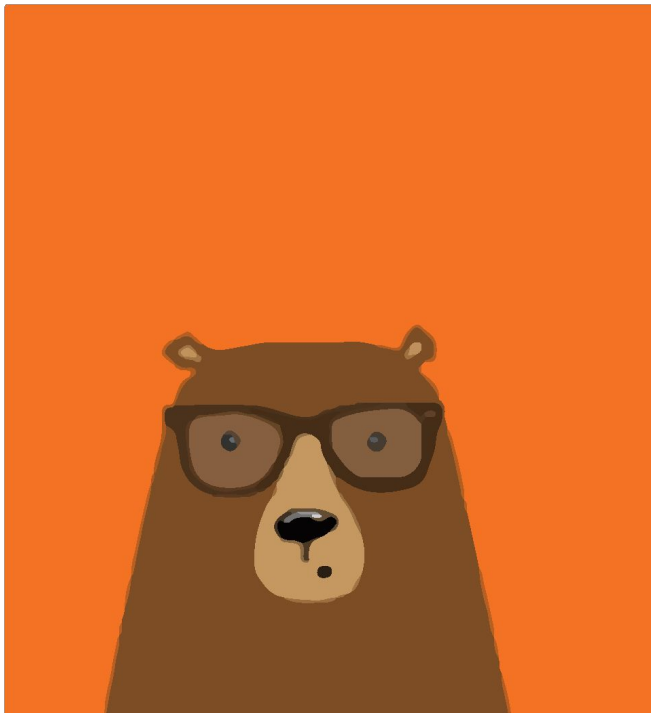
Designed to test all standards across grades 3-8. The assessment forms are paced to align with the Amplify Science curriculum sequence.

Benchmark Assessment Summary		
Grades 3-5	4 benchmarks per grade	14-15 items per form

Program Hub: Self Study Resources



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

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.

Creating Assignments in Schoology

- Click Add Materials.
- Select Add Assignment.
- Fill out the Create Assignment form.
- Options. Use Options to turn on/off the following features: Use Individually Assign to only display the assignment to a specific member of the course or a grading group.
- Click Create to complete

LAUSD Shared Logins

AmplifyScience

Go to: my.amplify.com

A. Log In with Amplify

District Shared Logins		
Grade	**Username**	**Password**
Kindergarten	LAUSDscienceK	LAUSD1234
1	LAUSDscience1	LAUSD1234
2	LAUSDscience2	LAUSD1234
3	LAUSDscience3	LAUSD1234
4	LAUSDscience4	LAUSD1234
5	LAUSDscience5	LAUSD1234
6	LAUSDscience6	LAUSD1234
7	LAUSDscience7	LAUSD1234
8	LAUSDscience8	LAUSD1234