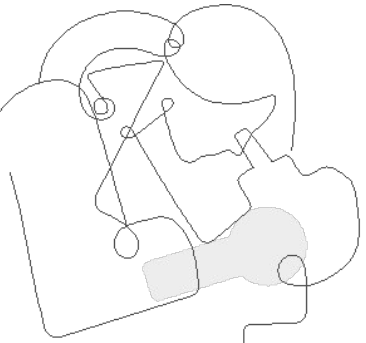
Amplify Science

Writing in Science

Grade 2, Unit 3: Changing Landforms

Part 3

Strengthen workshop



Los Angeles Unified School District
Saturday, March 18, 2023
Presented by

PLPG CERTIFIED PROVIDER

Ice Breaker!

Share a **WOW** moment from inside your classroom

- Think about a wow moment that you have experienced inside your classroom. Write it down on the sticky note.
- Circulate around the room, when the timer goes off share out with the person closest to you.
- When the music starts again start circulating again.
- When the music goes off, share out with the person closest to you.
- Add your sticky note to the ‘WOW Moment’ anchor chart.

Amplify's Purpose Statement

Dear teachers,

You do a job that is nearly impossible and **utterly essential.**

We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

Thank you for working with us to craft rigorous and riveting learning experiences for your classroom.

We share your goal of **inspiring all students to think deeply, creatively, and for themselves.**

Sincerely,
Amplify

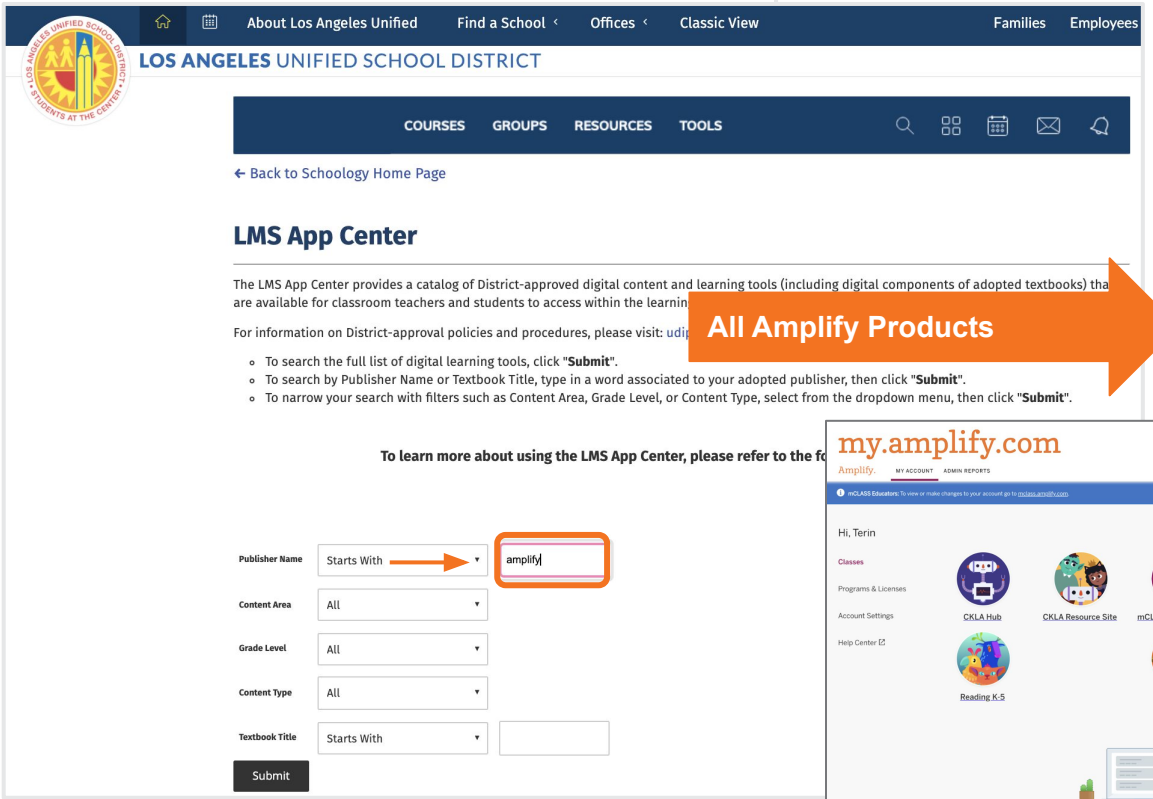
Why do scientists write?

Amplify.

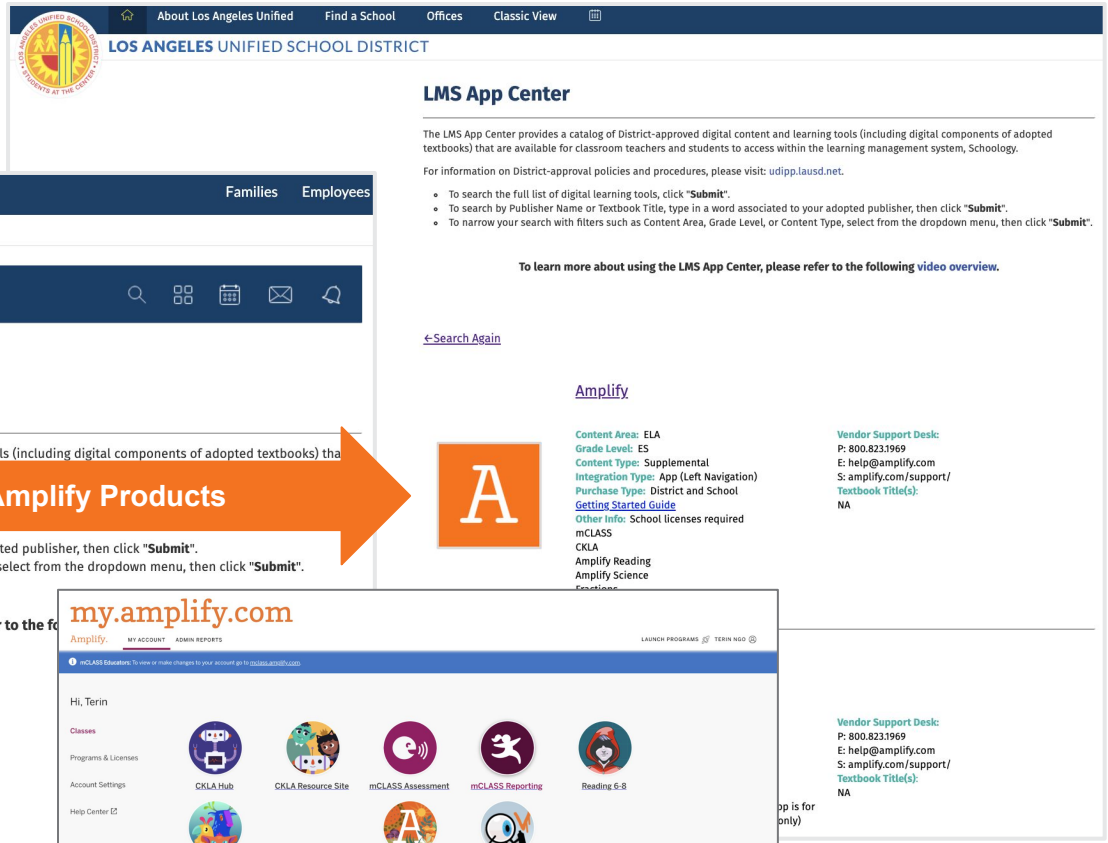
Norms: Establishing a culture of learners

- **Take risks:** Ask any questions, provide any answers.
- **Participate:** Share your thinking, participate in discussion and reflection.
- **Be fully present:** Unplug and immerse yourself in the moment.
- **Physical needs:** Stand up, get water, take breaks.

Schoology



All Amplify Products



Schoology

- To join Amplify ES Group: W4PK-W466-63F5B

Navigation Temperature Check

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

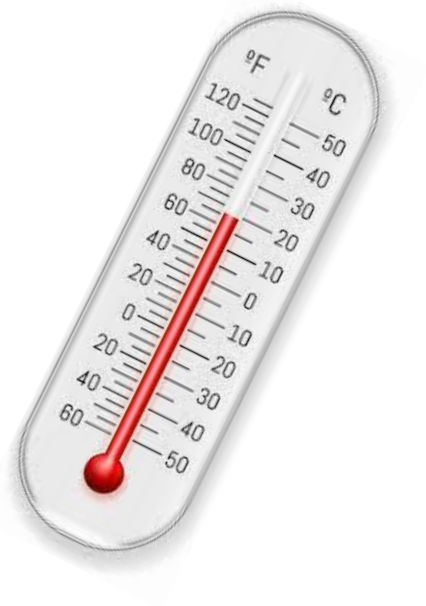
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable



Overarching goals

- ❑ Identify specific characteristics and genres unique to science writing
- ❑ Describe how the Amplify Science writing approach supports students to engage in science practices, make sense of science ideas, and develop as writers
- ❑ Be ready to teach specific writing activities in an Amplify Science unit

Plan for the day

- Introduction and framing
- Writing in Amplify Science
  - Writing as part of a multimodal experience
  - Supporting students with writing
  - Writing a culminating explanation or argument
  - Additional supports
- Model Lesson
- Planning
- Closing

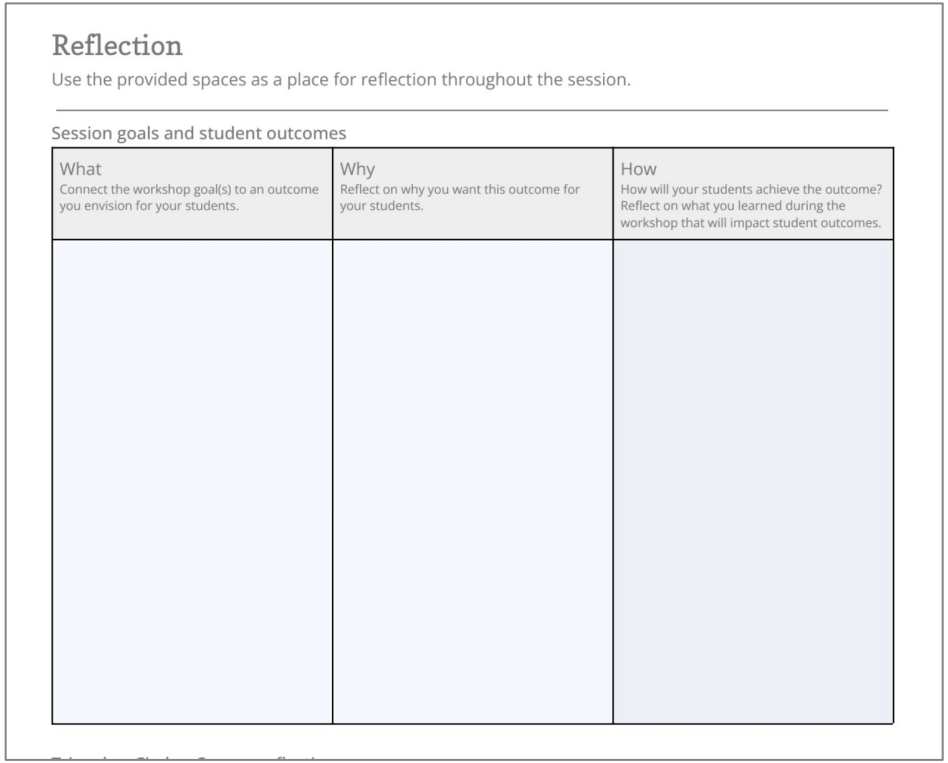
Opening Reflection

Pg. 2

What are your goals
for student outcomes?

Participant Notebook

https://bit.ly/3JliYhU



Reflection

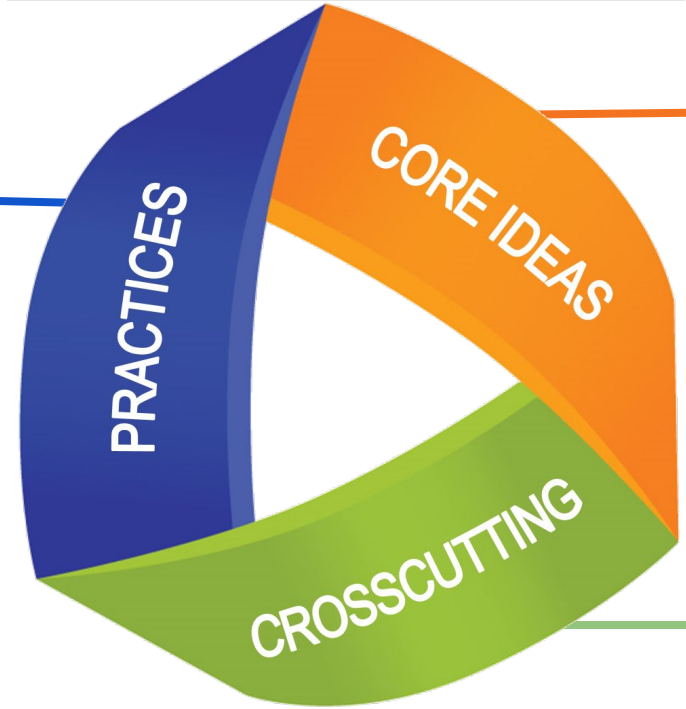
Use the provided spaces as a place for reflection throughout the session.

Session goals and student outcomes

What Connect the workshop goal(s) to an outcome you envision for your students.	Why Reflect on why you want this outcome for your students.	How How will your students achieve the outcome? Reflect on what you learned during the workshop that will impact student outcomes.

Figuring out phenomena

Using 3-D teaching and learning



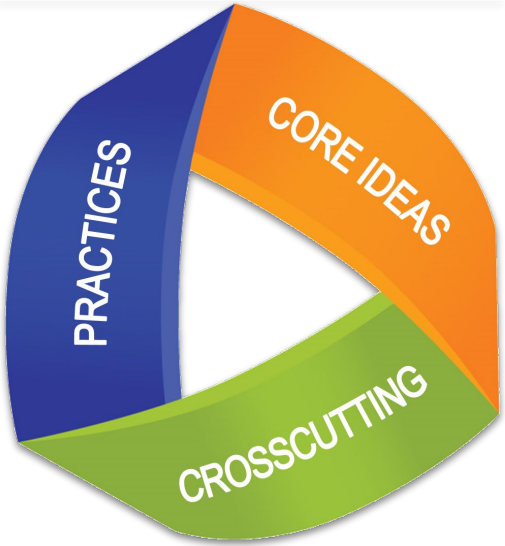
What scientists do
Science and Engineering Practices

What scientists want to know
Disciplinary Core Ideas

How scientists think
Crosscutting Concepts

Next Generation Science Standards

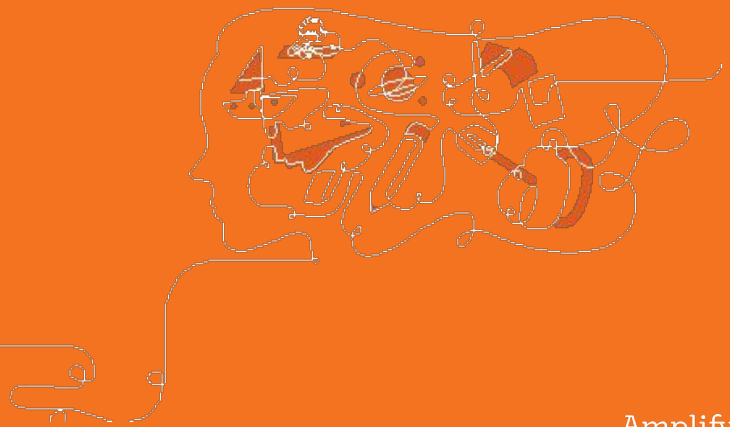
Science and Engineering Practices



1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

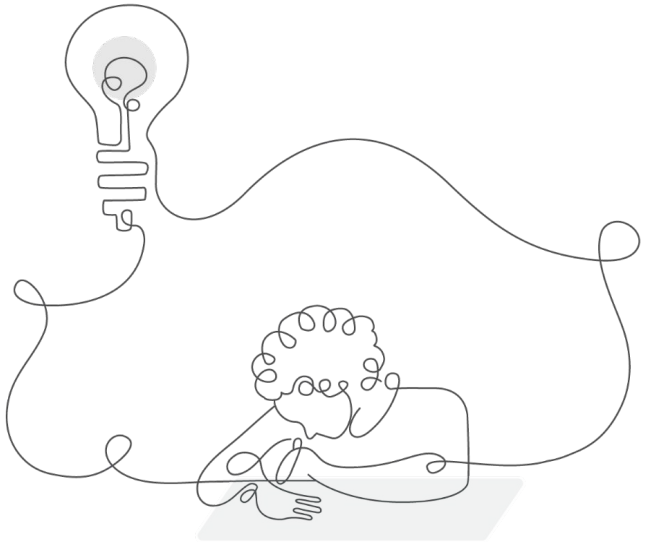
Writing in Amplify Science

Purposeful communicative writing is an integral part of the Amplify Science curriculum



Why do students write in Amplify Science?

- To activate background knowledge
- To reflect on understanding
- To engage in sense-making
- To record data / observations
- To organize ideas
- To communicate ideas
  - To explain
  - To persuade



Instructional approach

Introduce a **phenomenon** and a related problem

Collect **evidence** from multiple sources

Build increasingly complex **explanations**

Apply knowledge to a different context

Phenomena-based Instruction

Inquire like a scientist.

Think like a scientist.

Quantify like a scientist.

Read like a scientist.

Talk like a scientist.

✓ **Write** like a scientist.

Critique like a scientist.

Argue like a scientist.

Figuring out phenomena like a scientist.

Why do students write in Amplify Science?

- To activate background knowledge
- To reflect on understanding
- To engage in sense-making
- To record data / observations
- To organize ideas
- To communicate ideas
    - Explain
    - Persuade

Instructional approach

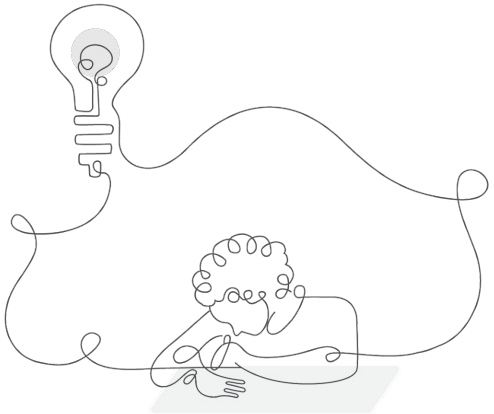
Plan for the day

- Introduction and framing
- **Writing in Amplify Science**
  - **Writing as part of a multimodal experience**
  - Supporting students with writing
  - Writing a culminating explanation or argument
  - Additional supports
- Model Lesson
- Planning
- Closing

Reviewing the unit phenomenon

Amplify Science units are designed around complex phenomena that drives student learning through the unit.

Pay attention to the phenomenon, or observable event, students will figure out in your unit.



Changing Landforms

Problem: Students help the director of the Oeanside Recreation Center determine if the center is safe after a nearby cliff collapse by investigating landforms and erosion.

Role: Geologist

We’re about to begin a new science unit.

We’ll be learning about why the **shape** of **land** can be **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.

When school lets out, kids can go to **summer camp** at Oceanside Recreation Center.

They do team-building activities and learn how to be better leaders.

Has anyone been to summer camp or to a place like Oceanside Recreation Center?

One place I have been to is _____.

Nearby Cliff

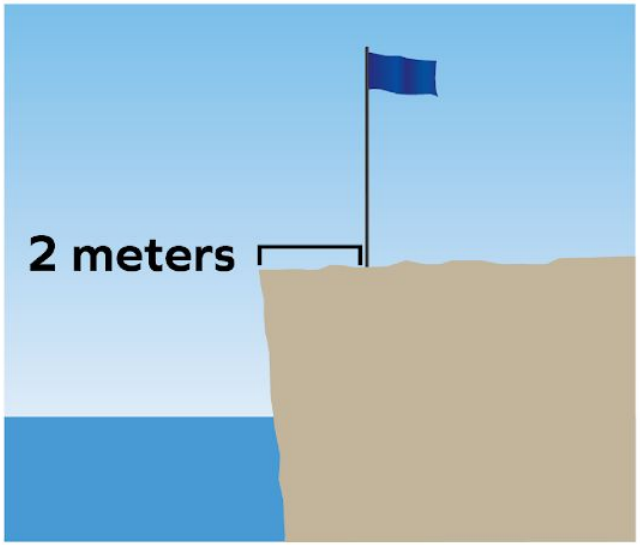
Director Higgins at Oceanside found out that a nearby cliff **collapsed.**

He is worried this might happen to the recreation center's cliff, putting visitors at risk.

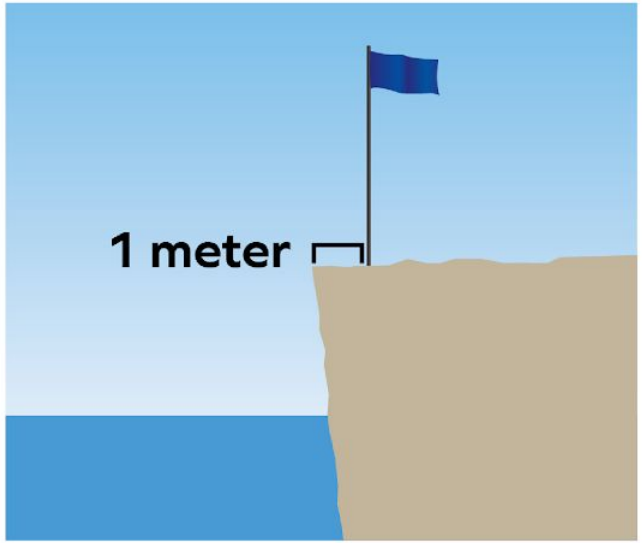
After researching the recreation center's cliff, Director Higgins found some important information.

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

A long time ago



Now



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.

Changing Landforms

Coherent Storylines

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

How did the recreation center's cliff change?

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

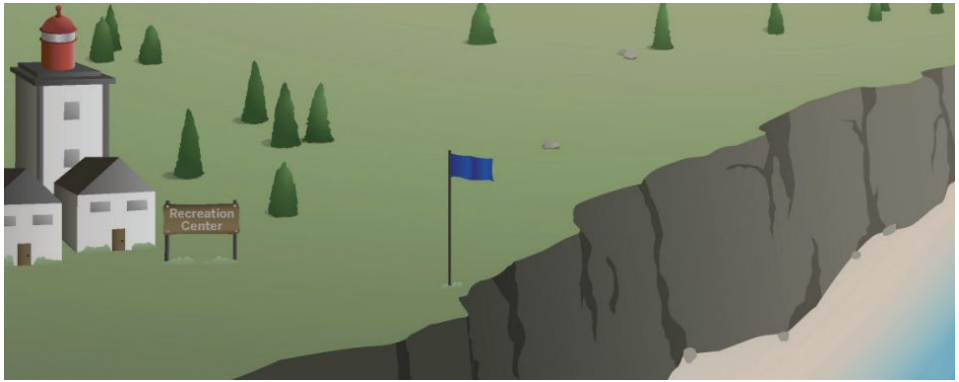
Could the recreation center's cliff erode quickly?

Sample instructional sequence

Grade 2 Changing Landforms

During the sample sequence, we'll experience some **small writes**.

Small writes are **short writing opportunities**. They're distinct from more formal end-of-chapter explanations or arguments (which we'll talk about later).



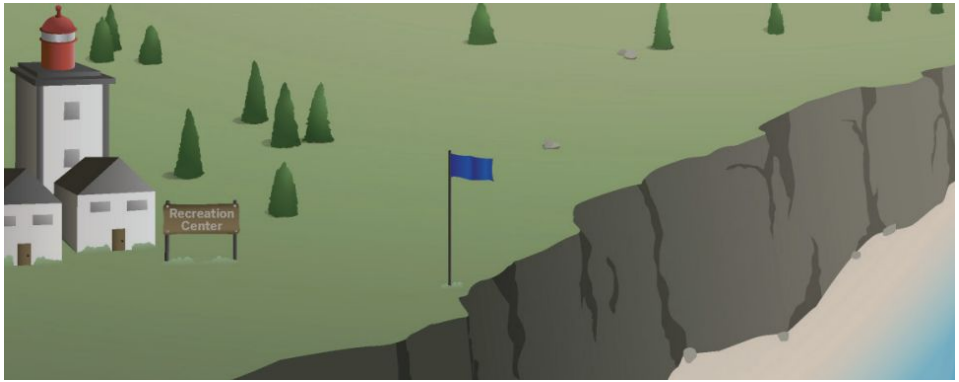
Sample instructional sequence

Grade 2 Changing Landforms

As you experience the small writes in the sequence, consider the **role** of each writing opportunity.

It may help to consider:

- Why are students writing?
- How is it useful to them in figuring out the phenomenon?

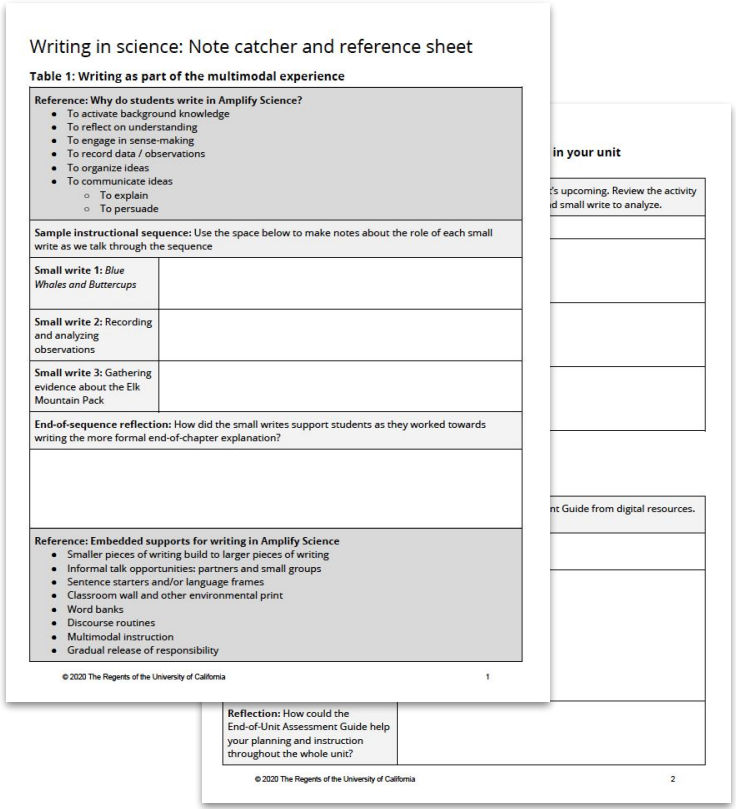


Pgs. 5-6

Sample instructional sequence

Note catcher

Use **Table 1** to keep track of your thinking during the instructional sequence.



Writing in science: Note catcher and reference sheet

Table 1: Writing as part of the multimodal experience

Reference: Why do students write in Amplify Science?
• To activate background knowledge
• To reflect on understanding
• To engage in sense-making
• To record data / observations
• To organize ideas
• To communicate ideas
  ○ To explain
  ○ To persuade	

Sample instructional sequence: Use the space below to make notes about the role of each small write as we talk through the sequence	
Small write 1: *Blue Whales and Buttercups*	
Small write 2: Recording and analyzing observations	
Small write 3: Gathering evidence about the Elk Mountain Pack	
End-of-sequence reflection: How did the small writes support students as they worked towards writing the more formal end-of-chapter explanation?	
Reference: Embedded supports for writing in Amplify Science • Smaller pieces of writing build to larger pieces of writing • Informal talk opportunities: partners and small groups • Sentence starters and/or language frames • Classroom wall and other environmental print • Word banks • Discourse routines • Multimodal instruction • Gradual release of responsibility	

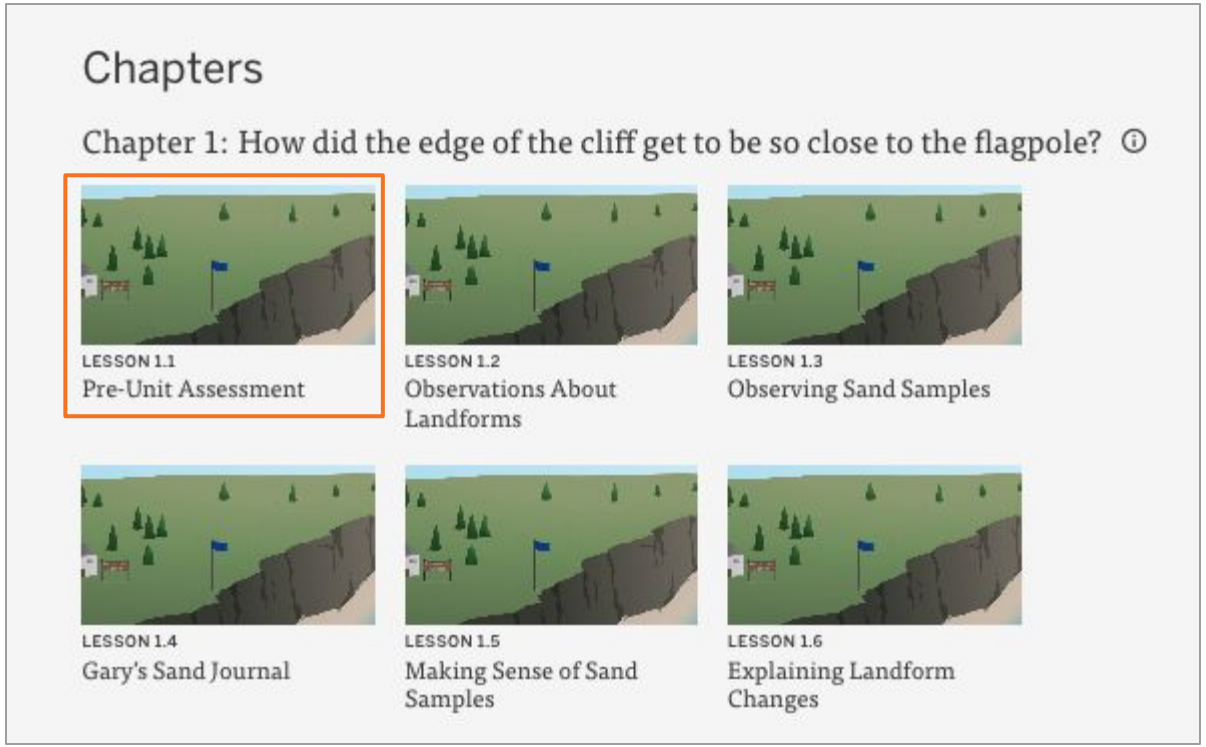
in your unit

's upcoming. Review the activity
d small write to analyze.

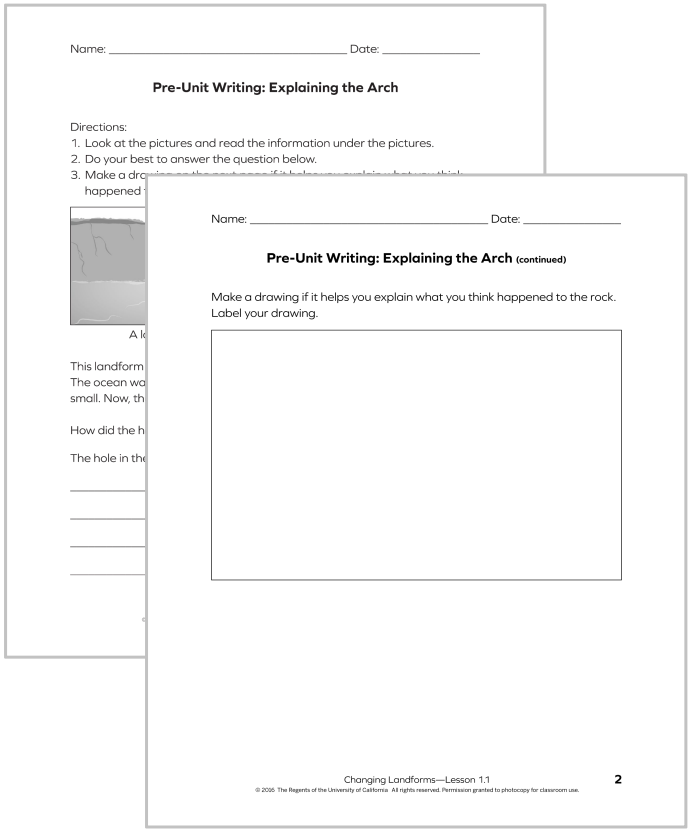
nt Guide from digital resources.

Reflection: How could the End-of-Unit Assessment Guide help your planning and instruction throughout the whole unit?	

Changing Landforms: Writing in Chapter 1



Small write 1: Writing Initial Explanations (1.1, Activity 2)



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 dr
happened

A l

This landform
The ocean wa
small. Now, th

How did the h

The hole in th

Name: _____ Date: _____

Pre-Unit Writing: Explaining the Arch (continued)

Make a drawing if it helps you explain what you think happened to the rock.
Label your drawing.

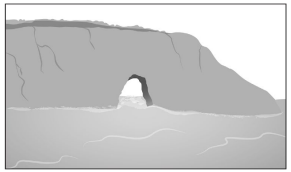
Changing Landforms—Lesson 1.1 **2**

Pre-Unit Assessment

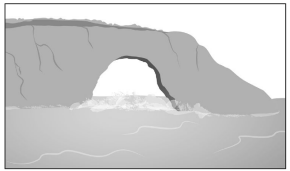
Name: _____ Date: _____

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 _____

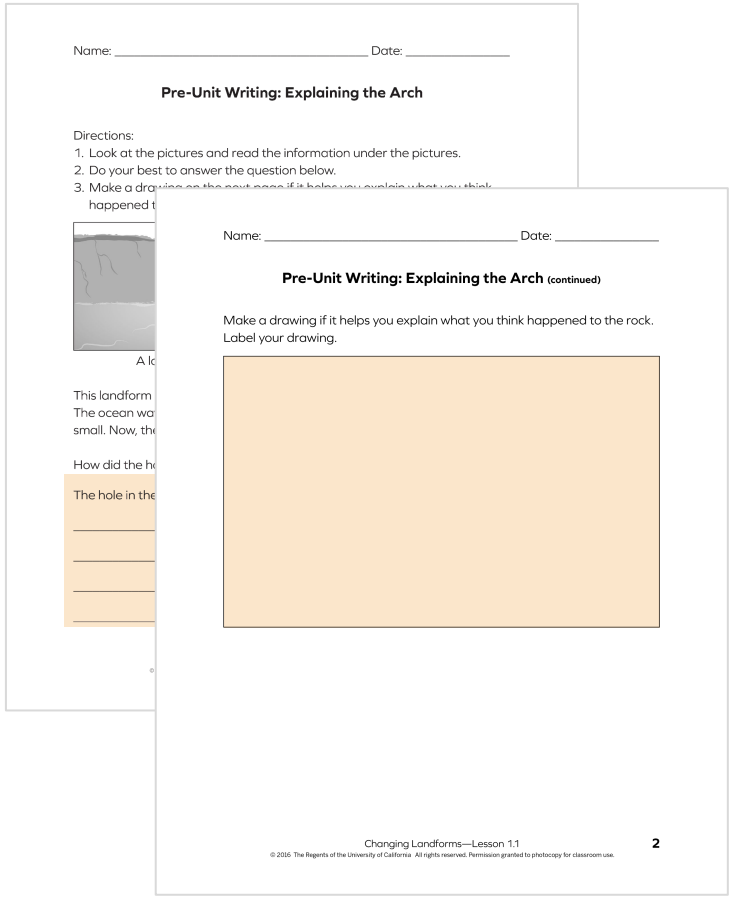
_____

_____

_____

_____

Let's **review the directions** and **read the arch information.**



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 dra... on the next page if it helps you explain what you think happened t...

A lo...

This landform ...
The ocean wa...
small. Now, th...

How did the h...

The hole in the ...

Name: _____ Date: _____

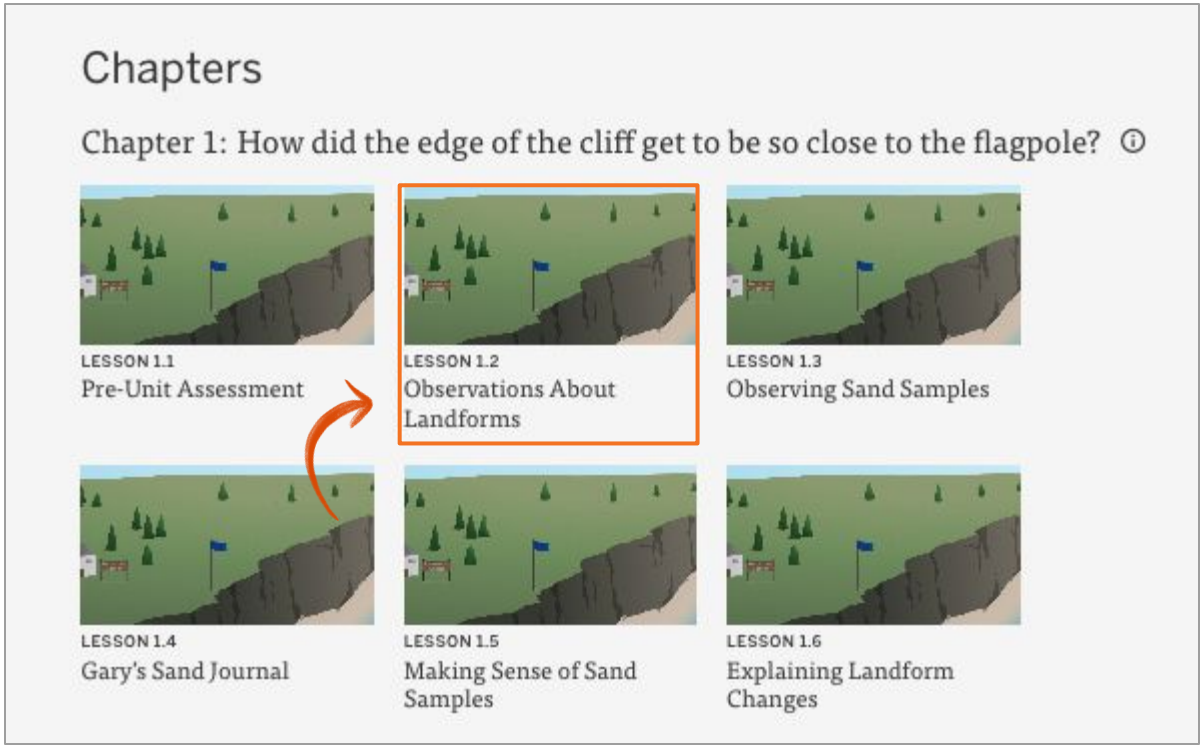
Pre-Unit Writing: Explaining the Arch (continued)

Make a drawing if it helps you explain what you think happened to the rock. Label your drawing.

Changing Landforms—Lesson 1.1 2

Write your responses and **create** a drawing if it helps you explain your thinking.

Changing Landforms: Writing in Chapter 1



Small write 2: Observations about Landforms: Recording Initial Ideas and Questions (1.2, Activity 1)

What are landforms made of?

What we know	Questions we have

What **ideas** do you have about what landforms are made of?

What are landforms made of?

What we know	Questions we have
	

What **questions** do you have about what landforms are made of?

What do you **wonder** about landforms?

Name: _____ Date: _____

What Landforms Are Made Of

Directions:
1. Choose a landform to draw.
2. In the box below, draw the landform and label it.
3. Below your diagram, explain what you think the landform is made of.

This landform is made of _____

_____.

Turn to page 6 in your notebooks.

We will create scientific drawings called **diagrams.**

It's important to label diagrams.

Name: _____ Date: _____

What Landforms Are Made Of

Directions:

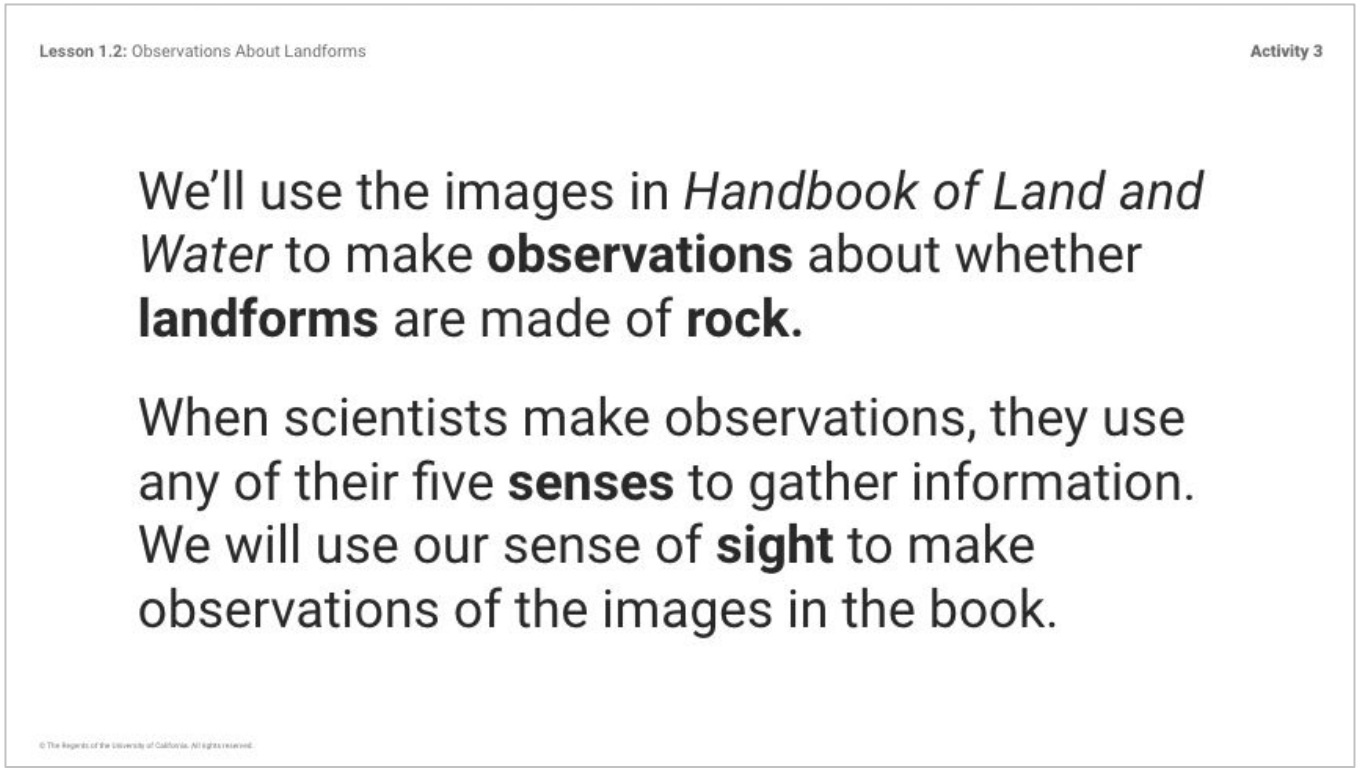
1. Choose a landform to draw.
2. In the box below, draw the landform and label it.
3. Below your diagram, explain what you think the landform is made of.

This landform is made of _____

_____.

Complete the diagram and the sentence.

Small write 3: Observation about Landforms: Creating Scientific Drawings, Labeling and Writing a Sentence (1.2, Activity 3)



Name: _____ Date: _____

Observations of Landforms

Directions:

1. Choose at least two landforms to read about in *Handbook of Land and Water.*
2. In the "Landform" column of the table below, record the names of the landforms.
3. In the "Observations" column, record observations that help you figure out whether landforms are made of rock.

Idea: Landforms are made of rock.

Landform	Observations

Turn to page 7 in your notebooks.

We'll make **observations** of the images in the book that can be used as **evidence** to support the idea that landforms are made of rock.

Name: _____ Date: _____

Observations of Landforms

Directions:

1. Choose at least two landforms to read about in *Handbook of Land and Water.*
2. In the "Landform" column of the table below, record the names of the landforms.
3. In the "Observations" column, record observations that help you figure out whether landforms are made of rock.

Idea: Landforms are made of rock.

Landform	Observations
cave	rock walls, rock on bottom of the cave, fallen rock

Turn back to page 7 in your notebooks.

Let's **record** our cave observations.

Name: _____ Date: _____

Observations of Landforms

Directions:

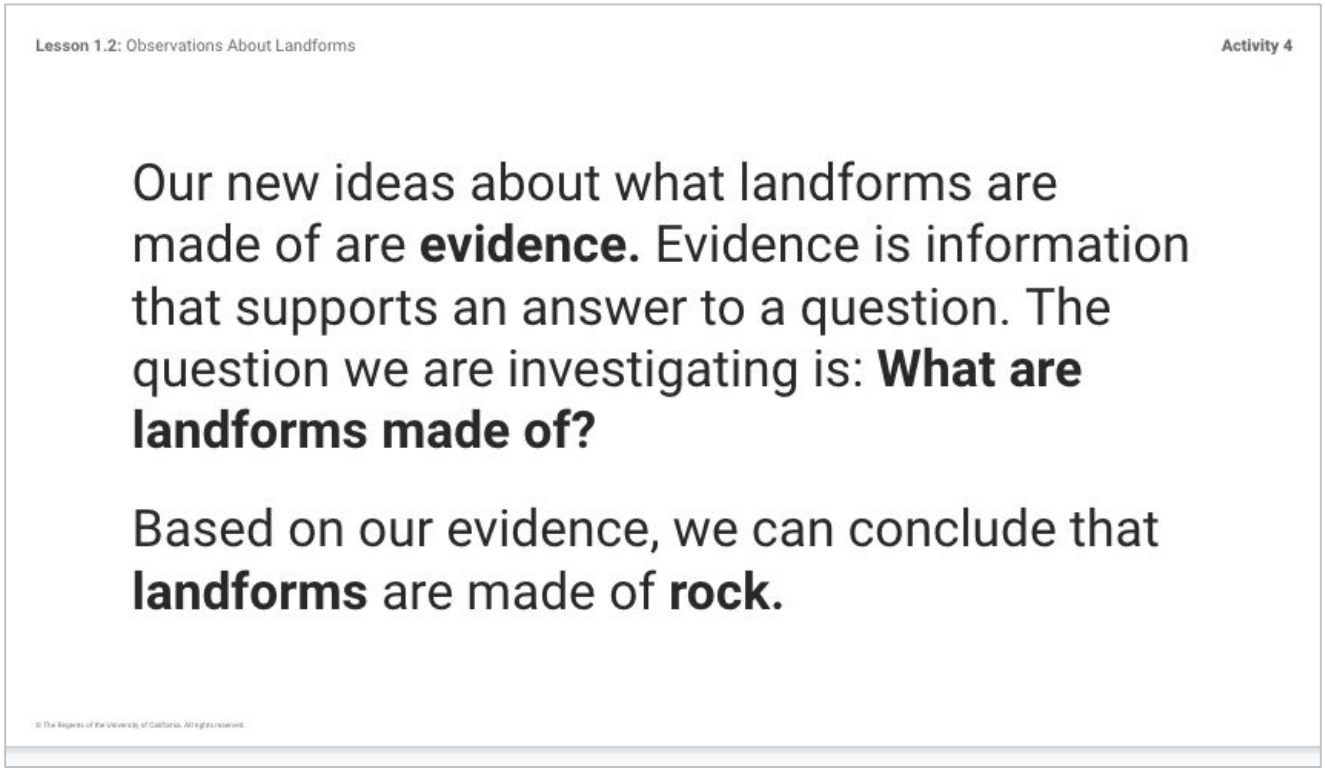
1. Choose at least two landforms to read about in *Handbook of Land and Water.*
2. In the "Landform" column of the table below, record the names of the landforms.
3. In the "Observations" column, record observations that help you figure out whether landforms are made of rock.

Idea: Landforms are made of rock.

Landform	Observations

Choose at least two other landforms and then **read** and **record** observations about them.

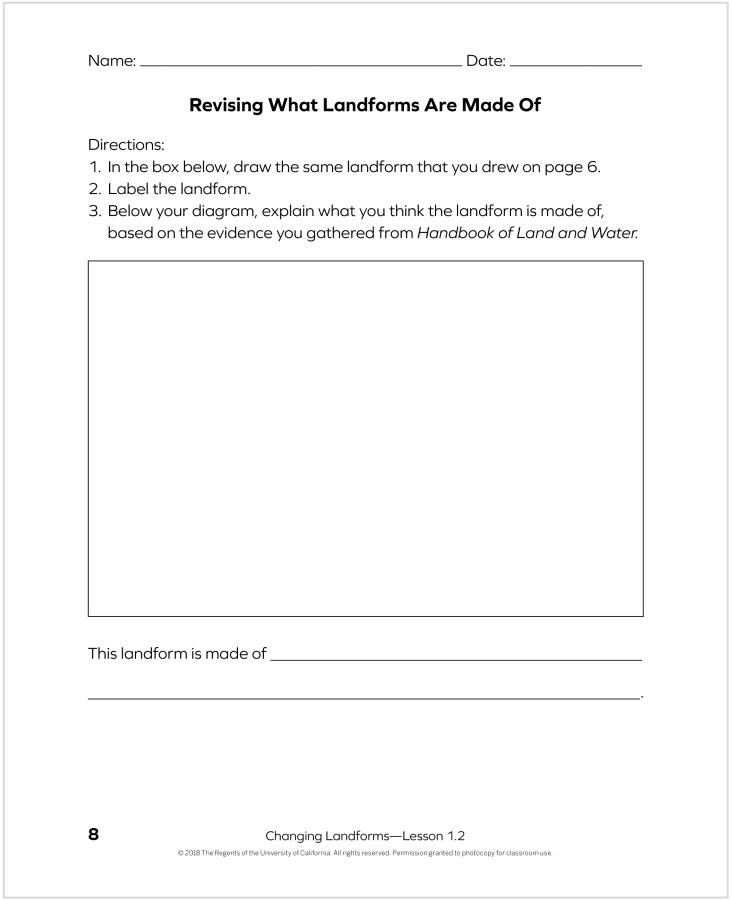
Small write 4: reflecting and revising observations about Landforms: (1.2, Activity 4)



What are landforms made of?

What we know	Questions we have
	

Would anyone like to **revise** their ideas or **add** new ideas to answer the question: **What are landforms made of?**



Name: _____ Date: _____

Revising What Landforms Are Made Of

Directions:

1. In the box below, draw the same landform that you drew on page 6.
2. Label the landform.
3. Below your diagram, explain what you think the landform is made of, based on the evidence you gathered from *Handbook of Land and Water.*

This landform is made of _____

_____.

8

Changing Landforms—Lesson 1.2

Turn to page 8 in your notebooks.

If scientists gather new **evidence** that makes them change their ideas, they **revise** their **diagrams** to show their new ideas.

Name: _____ Date: _____

Revising What Landforms Are Made Of

Directions:

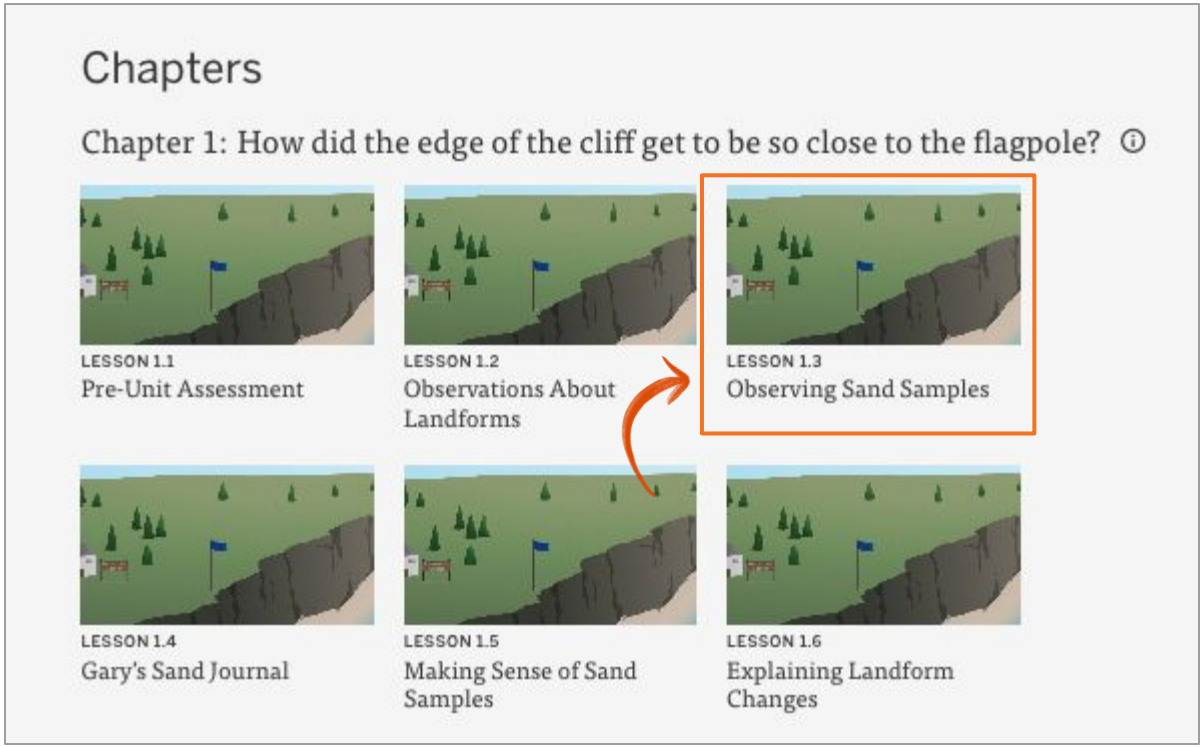
1. In the box below, draw the same landform that you drew on page 6.
2. Label the landform.
3. Below your diagram, explain what you think the landform is made of, based on the evidence you gathered from *Handbook of Land and Water.*

This landform is made of _____

_____.

Create a new diagram using evidence from the books.

Changing Landforms: Writing in Chapter 1



We will make **observations** of **sand** using our sense of sight.

Each group will get a tray of materials with **sand samples,** hand lenses, glue, and index cards.

Observing Sand Samples

Step 1

Observe one of the sand samples inside its bag.

Step 2

Trade sand samples with another group member.

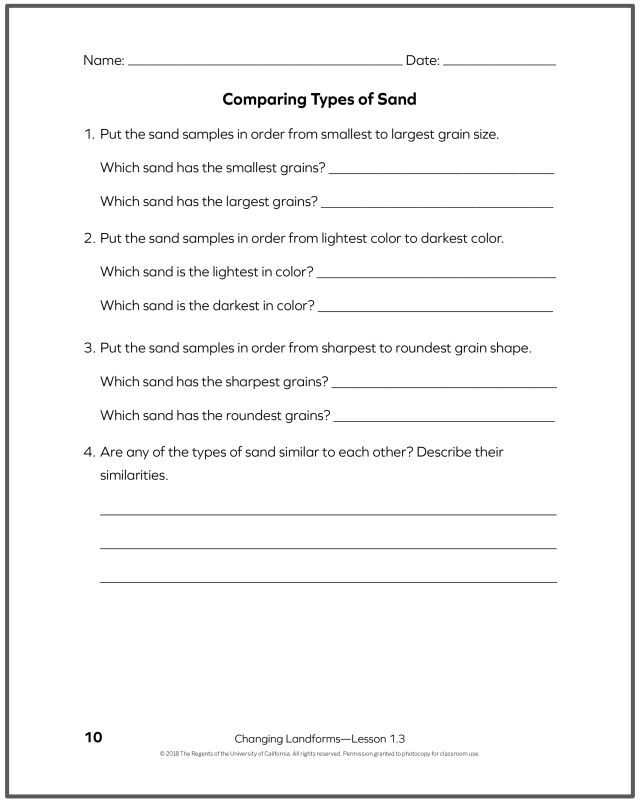
Step 3

Talk about what you notice.

What **observations** did you make about the sand samples?

What **questions** do you have about sand?

Small write 5: Observations Sand Samples: Recording Comparison of Sand Samples (1.3,Activity 2)



Name: _____ Date: _____

Comparing Types of Sand

1. Put the sand samples in order from smallest to largest grain size.

   Which sand has the smallest grains? _____

   Which sand has the largest grains? _____

2. Put the sand samples in order from lightest color to darkest color.

   Which sand is the lightest in color? _____

   Which sand is the darkest in color? _____

3. Put the sand samples in order from sharpest to roundest grain shape.

   Which sand has the sharpest grains? _____

   Which sand has the roundest grains? _____

4. Are any of the types of sand similar to each other? Describe their similarities.

   _____

   _____

   _____

10 Changing Landforms—Lesson 1.3

Turn to page 10 in your notebooks.

To **compare** means to notice how things are **similar** or **different.** We will compare the four sand samples.

Name: _____ Date: _____

Comparing Types of Sand

1. Put the sand samples in order from smallest to largest grain size.

   Which sand has the smallest grains? _____

   Which sand has the largest grains? _____

2. Put the sand samples in order from lightest color to darkest color.

   Which sand is the lightest in color? _____

   Which sand is the darkest in color? _____

3. Put the sand samples in order from sharpest to roundest grain shape.

   Which sand has the sharpest grains? _____

   Which sand has the roundest grains? _____

4. Are any of the types of sand similar to each other? Describe their similarities.

   _____

   _____

   _____

Work in groups to **compare** the sand samples. Each group member should **complete** their own notebook page.

Name: _____ Date: _____

Comparing Types of Sand

1. Put the sand samples in order from smallest to largest grain size.

   Which sand has the smallest grains? _____

   Which sand has the largest grains? _____

2. Put the sand samples in order from lightest color to darkest color.

   Which sand is the lightest in color? _____

   Which sand is the darkest in color? _____

3. Put the sand samples in order from sharpest to roundest grain shape.

   Which sand has the sharpest grains? _____

   Which sand has the roundest grains? _____

4. Are any of the types of sand similar to each other? Describe their similarities.

   _____

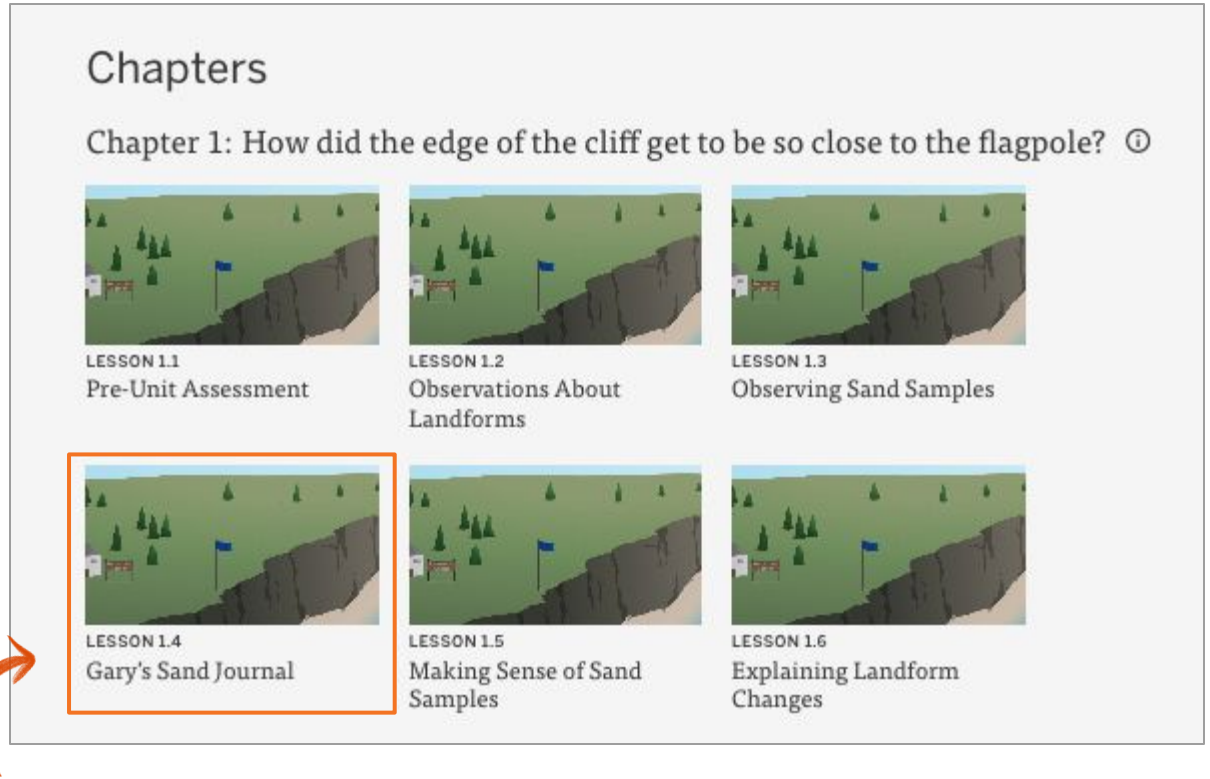
   _____

   _____

I'll record some of our class observations.

What did you **observe** when you **compared** the sand samples?

Changing Landforms: Writing in Chapter 1



Small write 6: Gary's Sand Journal: Recording Observations in a Table (1.4. Activity 3)

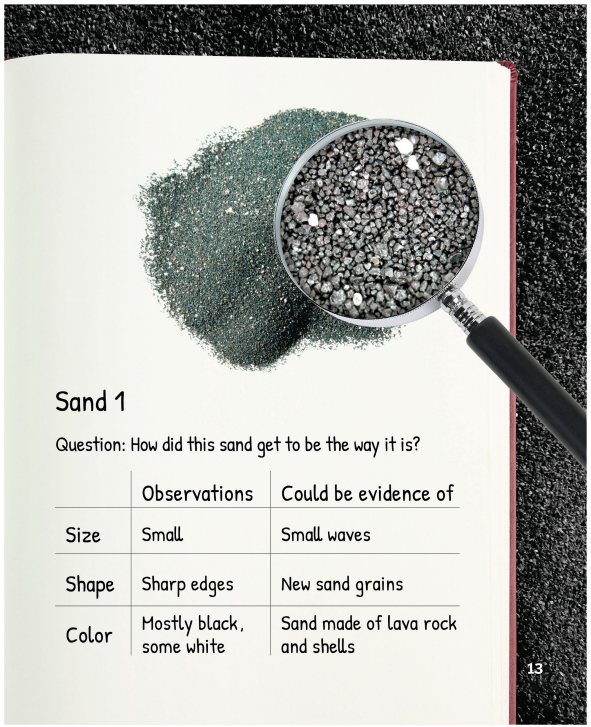
Sand 1

Question: How did this sand get to be the way it is?

	Observations	Could be evidence of
Size	Small	Small waves
Shape	Sharp edges	New sand grains
Color	Mostly black, some white	Sand made of lava rock and shells

13

Scientists use **tables** like the ones in *Gary's Sand Journal* to **organize information** they gather when investigating their questions.



Sand 1

Question: How did this sand get to be the way it is?

	Observations	Could be evidence of
Size	Small	Small waves
Shape	Sharp edges	New sand grains
Color	Mostly black, some white	Sand made of lava rock and shells

13

Gary **observed** a **pattern,** something that was similar over and over again, in these grains of sand. Most of them are small. He **recorded** his **observation** in the table.

Name: _____ Date: _____

Mystery Sand

Directions:

1. Turn to page 21 in *Gary's Sand Journal*.
2. Look at the photo of the mystery sand and record your observations in the "Observations" column in the table below.
3. Record what your observations could be evidence of in the last column.
4. When you finish recording your observations, answer the questions on the next page.

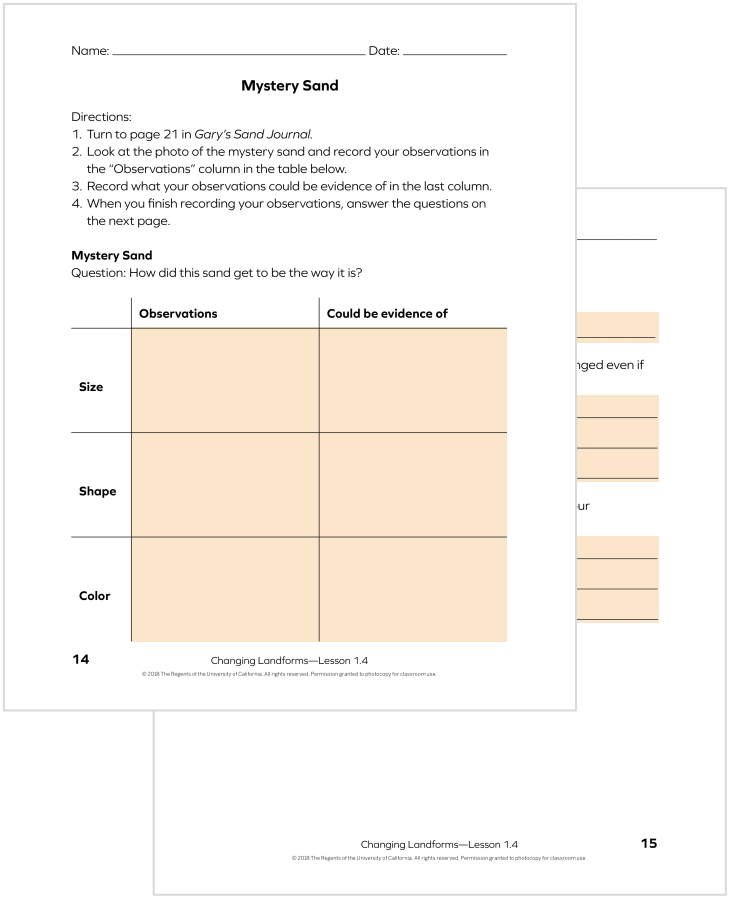
Mystery Sand

Question: How did this sand get to be the way it is?

	Observations	**Could be evidence of**
Size		
Shape		
Color		

Turn to page 14 in your notebooks.

As we observe the mystery sand, we'll look for **patterns** in the sand's **size, shape,** and **color.**



Name: _____ Date: _____

Mystery Sand

Directions:

1. Turn to page 21 in *Gary's Sand Journal*.
2. Look at the photo of the mystery sand and record your observations in the "Observations" column in the table below.
3. Record what your observations could be evidence of in the last column.
4. When you finish recording your observations, answer the questions on the next page.

Mystery Sand

Question: How did this sand get to be the way it is?

	Observations	Could be evidence of
Size		
Shape		
Color		

14 Changing Landforms—Lesson 1.4

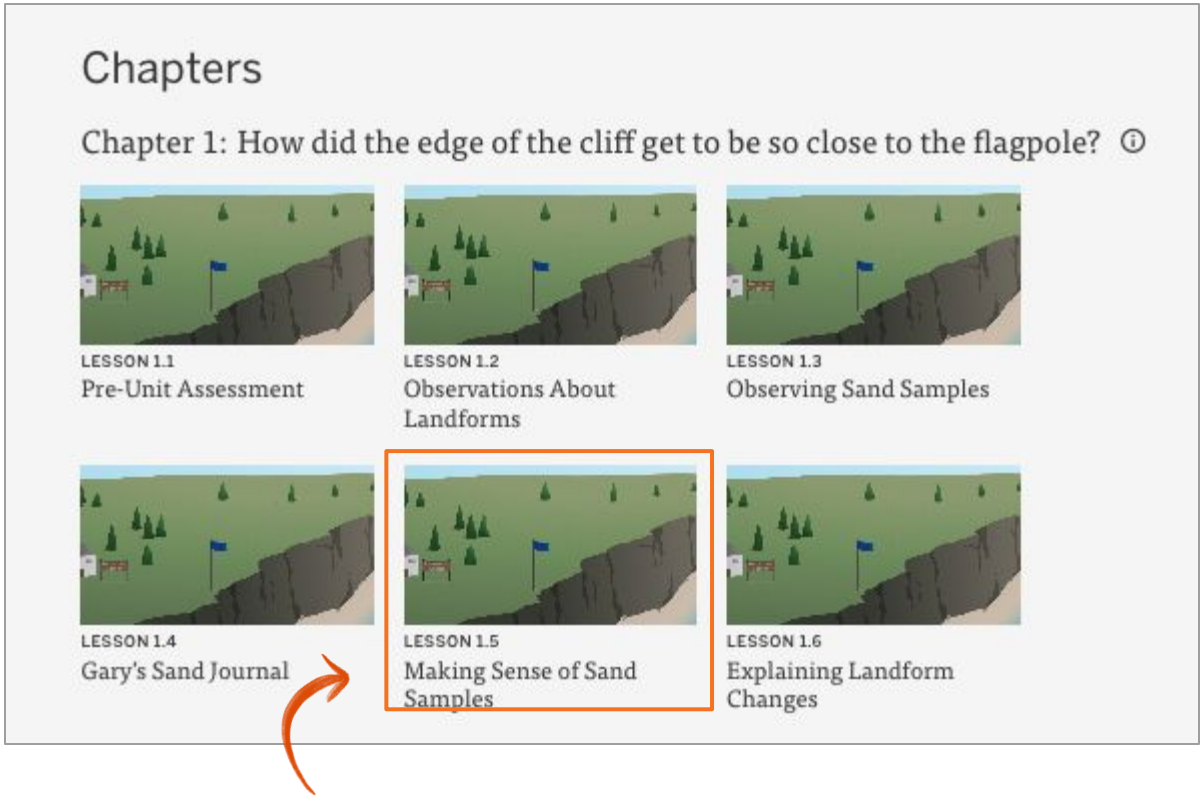
nged even if

ur

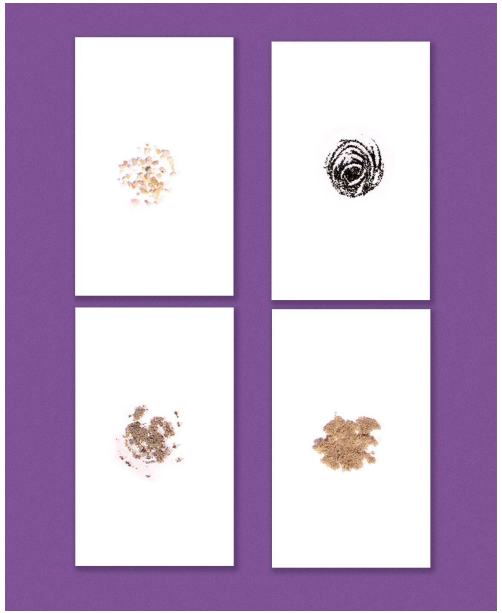
Changing Landforms—Lesson 1.4 15

Complete the table and **answer** the questions on notebook pages 14 and 15.

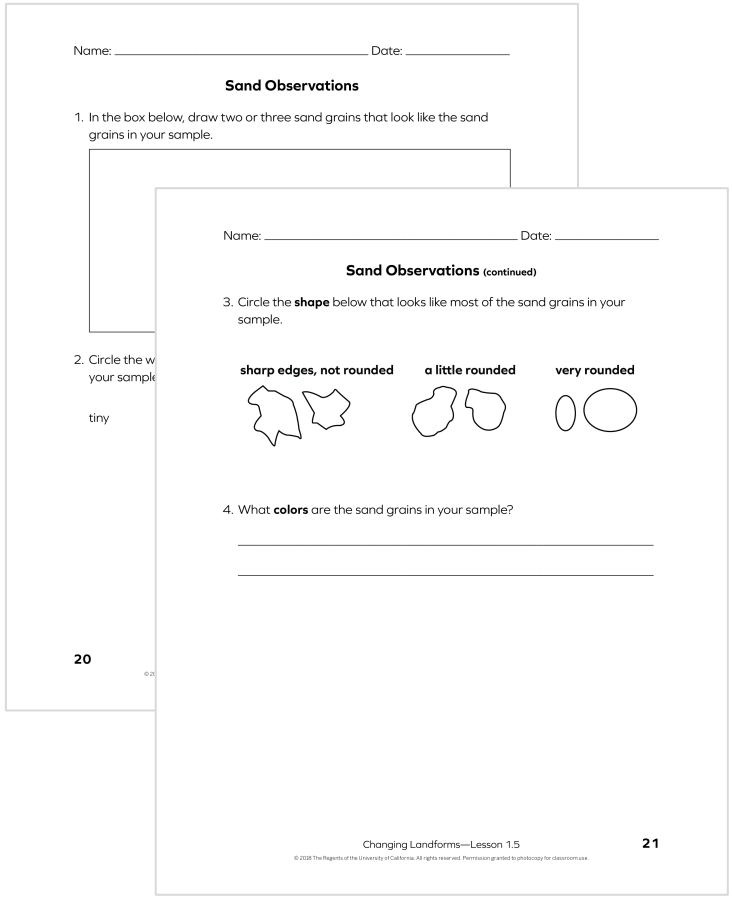
Changing Landforms: Writing in Chapter 1



Small write 7: Making Sense of Sand Samples: Recording Observations of our Samples (1.5)



We'll use our **Sand Sample Cards** to make careful observations of sand, just like Gary did, in order to explain how the sand got to be the way it is.



Name: _____ Date: _____

Sand Observations

1. In the box below, draw two or three sand grains that look like the sand grains in your sample.

2. Circle the w
your sample

tiny

20

Name: _____ Date: _____

Sand Observations (continued)

3. Circle the **shape** below that looks like most of the sand grains in your sample.

sharp edges, not rounded **a little rounded** **very rounded**

4. What **colors** are the sand grains in your sample?

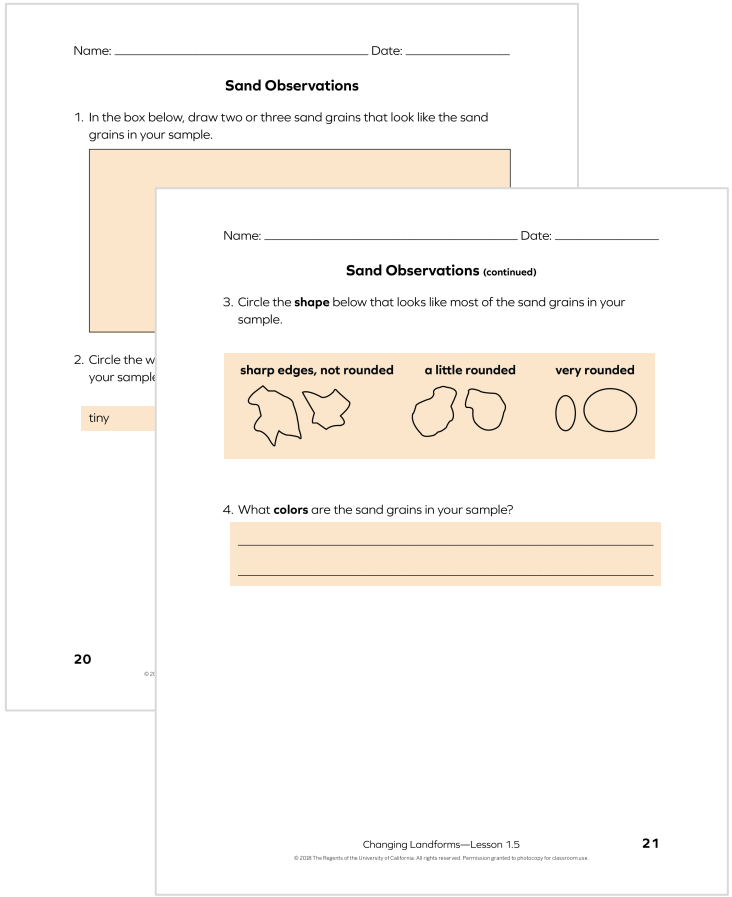
_____

_____

Changing Landforms—Lesson 1.5 21

Turn to pages 20–21 in your notebooks.

We'll **observe** our sand samples with hand lenses, and then **record** our observations.



Name: _____ Date: _____

Sand Observations

1. In the box below, draw two or three sand grains that look like the sand grains in your sample.

2. Circle the w
your sample

tiny

20

Name: _____ Date: _____

Sand Observations (continued)

3. Circle the **shape** below that looks like most of the sand grains in your sample.

sharp edges, not rounded	a little rounded	very rounded

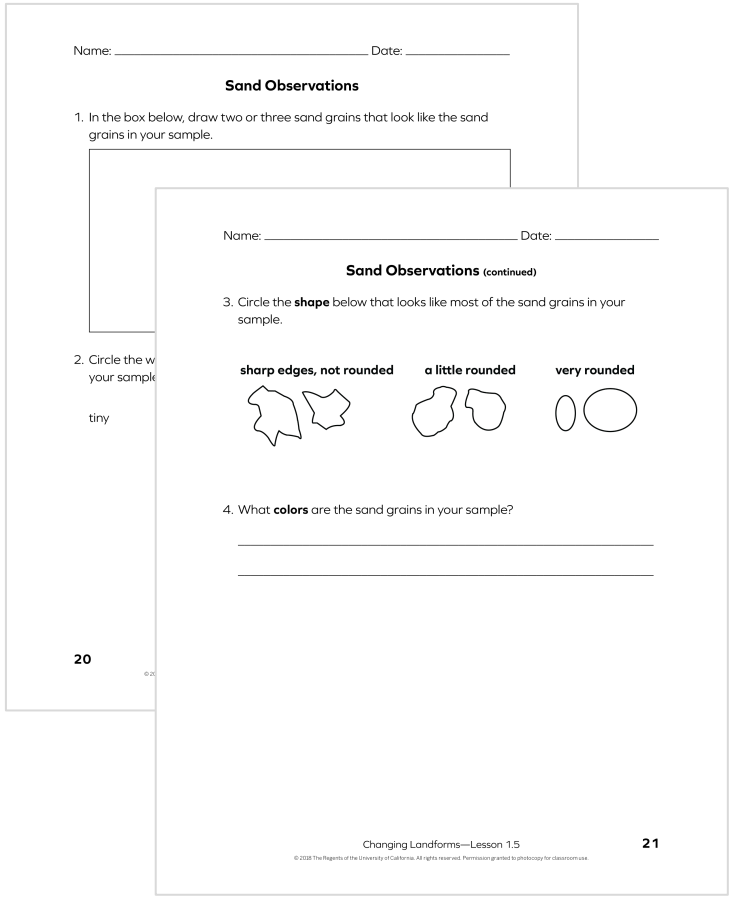
4. What **colors** are the sand grains in your sample?

_____

_____

Changing Landforms—Lesson 1.5 21

Observe your samples and **record** your observations.



Name: _____ Date: _____

Sand Observations

1. In the box below, draw two or three sand grains that look like the sand grains in your sample.

2. Circle the w
your sample

tiny

20

Name: _____ Date: _____

Sand Observations (continued)

3. Circle the **shape** below that looks like most of the sand grains in your sample.

sharp edges, not rounded **a little rounded** **very rounded**

4. What **colors** are the sand grains in your sample?

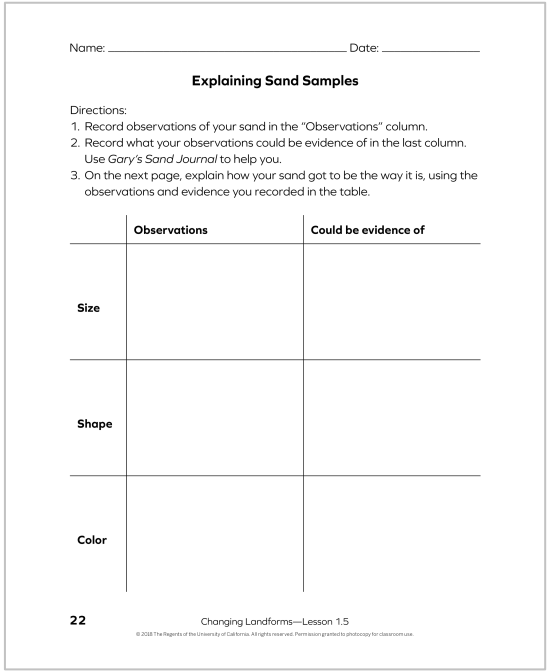
_____

_____

Changing Landforms—Lesson 1.5 21

Share your sand observations with a partner who observed the same type of sand.

Small write 8: Making Sense of Sand Samples: Completing a Table and Writing about Sand Samples (1.5)



Name: _____ Date: _____

Explaining Sand Samples

Directions:

1. Record observations of your sand in the "Observations" column.
2. Record what your observations could be evidence of in the last column. Use *Gary's Sand Journal* to help you.
3. On the next page, explain how your sand got to be the way it is, using the observations and evidence you recorded in the table.

	Observations	Could be evidence of
Size		
Shape		
Color		

Turn to page 22 in your notebooks.

This **table** is similar to the tables in *Gary's Sand Journal* and the one we completed about the **mystery sand.**

Name: _____ Date: _____

Explaining Sand Samples (continued)

Question: How did your sand get to be the way it is?

The size of my sand grains is _____.

They are this size because _____

_____

_____.

The shape of my sand grains is _____.

They are this shape because _____

_____

_____.

The colors of my sand grains are _____.

They are these colors because _____

_____

_____.

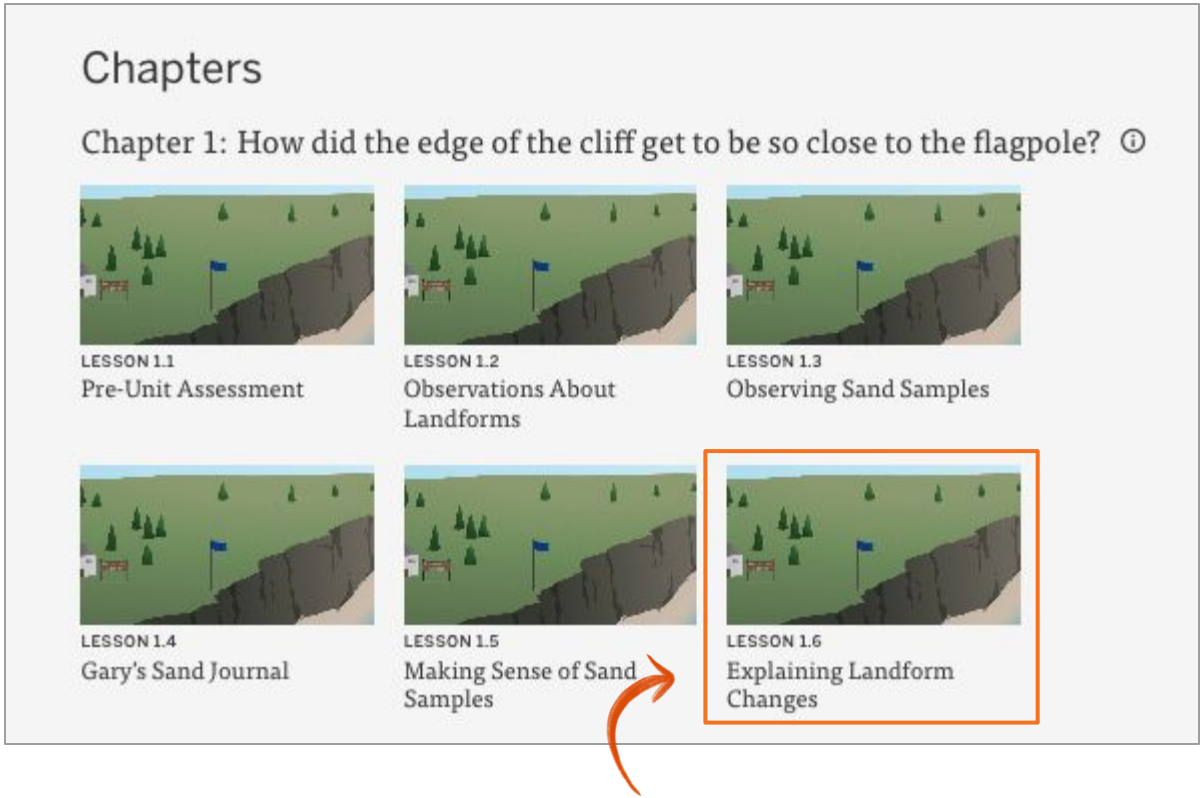
After filling in the table, you'll **complete the statements** on page 23.

Observation and Evidence Words

Size Words	Shape Words
small medium big	rounded a little rounded jagged pointy sharp smooth
Color Words	
red brown black orange yellow white	

Complete pages 22–23 in your notebooks, using these words and the sand observations you made on pages 20–21.

Changing Landforms: Writing in Chapter 1



Small write 9 : Explaining Landform Changes: Analyzing Observational Data and Writing Explanations (1.6)

What Is a Scientific Explanation?

1. It answers a question.

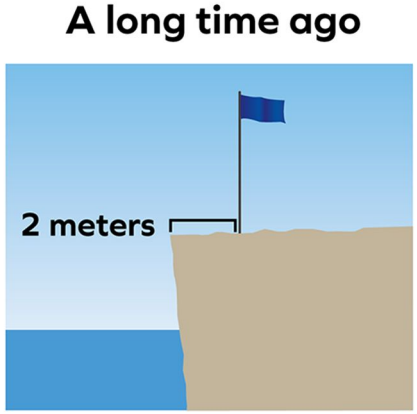
2. It is based on science ideas you have learned.

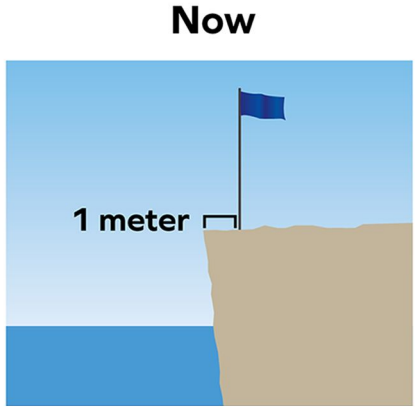
3. It is shared with someone.

Scientific Explanation: Changes to the Cliff

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

Together, we will **write a scientific explanation** to answer the question on this chart.





How do you think the edge of the cliff got to be so close to the flagpole?

Scientific Explanation: Changes to the Cliff

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

Let's begin **writing our explanation,** based on our discussions.

Sample Shared Write: End of chapter explanation

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

The edge of the cliff is closer to the flagpole because the cliff changed shape. A cliff is a landform, and landforms are made of rock. We know that rock can change shape and because the cliff is made of rock, it can change shape, too.

Reflecting on the small writes

How did the short writing opportunities in this chapter support students as they worked towards writing the more formal end-of-chapter explanation?

Small Writes
Writing explanations about what students know about landforms
Activating prior knowledge using the Anticipatory Chart
Creating, labeling, and writing a diagram of a landform
Recording observations of landforms from text and investigations
Recording possible evidence for observations

What were the different types of writing in Chapter 1?

Small Writes
Writing explanations about what students know about landforms
Activating prior knowledge using the Anticipatory Chart
Creating, labeling, and writing a diagram of a landform
Recording observations of landforms from text and investigations
Recording possible evidence for observations

Writing across a chapter: *Changing Landforms* Chapter 1

Lesson 1.1	Lesson 1.2	Lesson 1.3	Color Codes
Pre-unit assessment: Explaining how did the hole (arch) in the rock get bigger.	Activating prior knowledge using the Anticipatory Chart Creating, labeling, and writing a diagram of a landform. Recording observations of landforms from a text Revising diagrams based on new evidence	Recording data from investigations comparing sand samples Daily written reflection	Record data / observations Activate prior knowledge and reflect on understanding Organize and keep track of ideas Explain or persuade Sense making

Writing across a chapter: *Environment and Survival* Chapter 1

Lesson 1.4	Lesson 1.5	Lesson 1.6
Getting Ready to Read: Gary's Journal Sharing Ideas	Recording information from Investigation of Sand Samples	Check for Understanding
Recording obserfations from photos and possible evidence	Writing about Sand samples using evidence from text and observation from investigations	Write a scientific explanation about how the edge of the cliff get to be so close to the flagpole
Multiple Meaning Words: Gary's Journal	Daily written reflection	Daily written reflection
Daily written reflection		

Record data / observations

Reflect on understanding

Organize or keep track of ideas

Explain or Persuade

Sense making

Writing across a chapter: *Changing Landforms* Chapter 1

Lesson 1.1	Lesson 1.2	Lesson 1.3	Color Codes
Pre-unit assessment: Explaining how did the hole (arch) in the rock get bigger.	Activating prior knowledge using the Anticipatory Chart Creating, labeling, and writing a diagram of a landform. Recording observations of landforms from a text Revising diagrams based on new evidenc	Recording data from investigations comparing sand samples Daily written reflection	Record data / observations Activate prior knowledge and reflect on understanding Organize and keep track of ideas Explain or persuade Sense making

Writing across a chapter: *Changing Landforms* Chapter 1

Lesson 1.4	Lesson 1.5	Lesson 1.6
Getting Ready to Read: Gary's Journal Sharing Ideas	Recording information from Investigation of Sand Samples	Check for Understanding
Recording observations and visualizations from photos and possible evidence	Writing about Sand samples using evidence from text and observation from investigations	Write a scientific explanation about how the edge of the cliff get to be so close to the flagpole
Multiple Meaning Words: Gary's Journal	Daily written reflection	Daily written reflection
Daily written reflection		

Record data / observations

Reflect on understanding

Organize or keep track of ideas

Explain or Persuade

Sense making

Instructional supports

Sense-making strategies: How are students reading?

- Setting a purpose
- Visualizing
- Making predictions
- Asking questions
- Making inferences
- Synthesizing

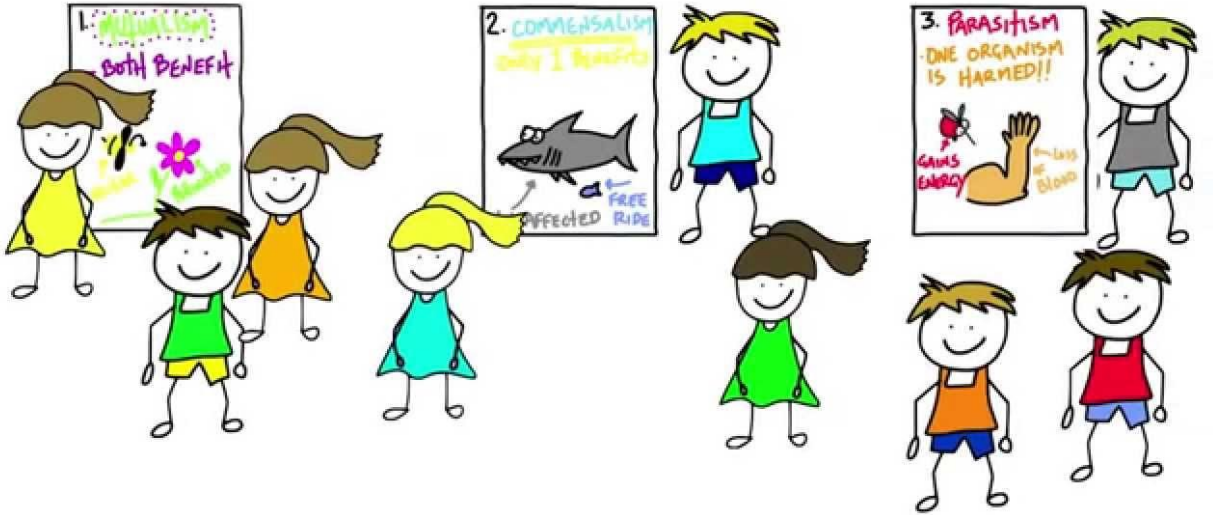
Group Work

Small write sequences in Chapters 2,3, and 4

- With your group or partner pick a chapter in this unit.
- Chart the small writes within the lessons of the chapter
- Identify what purpose each small write has

Small Writes in a chapter

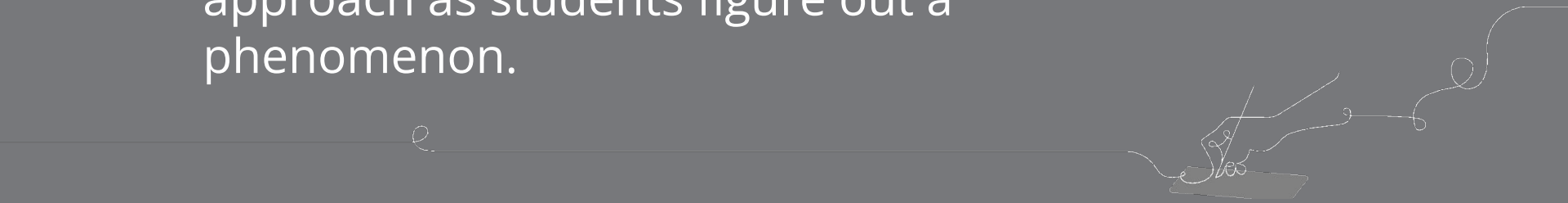
Gallery Walk



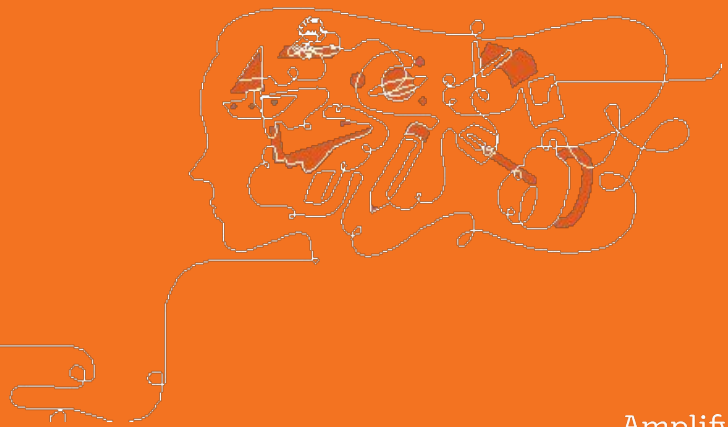
Key takeaway

As they gather evidence, students engage in writing and discussion. They make sense of evidence they gather through small writes.

Writing is a key part of the multimodal approach as students figure out a phenomenon.



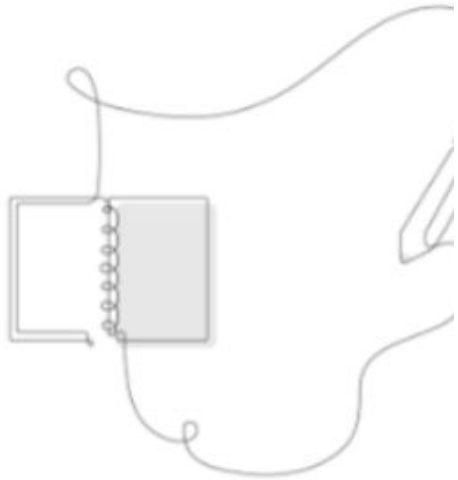
Break



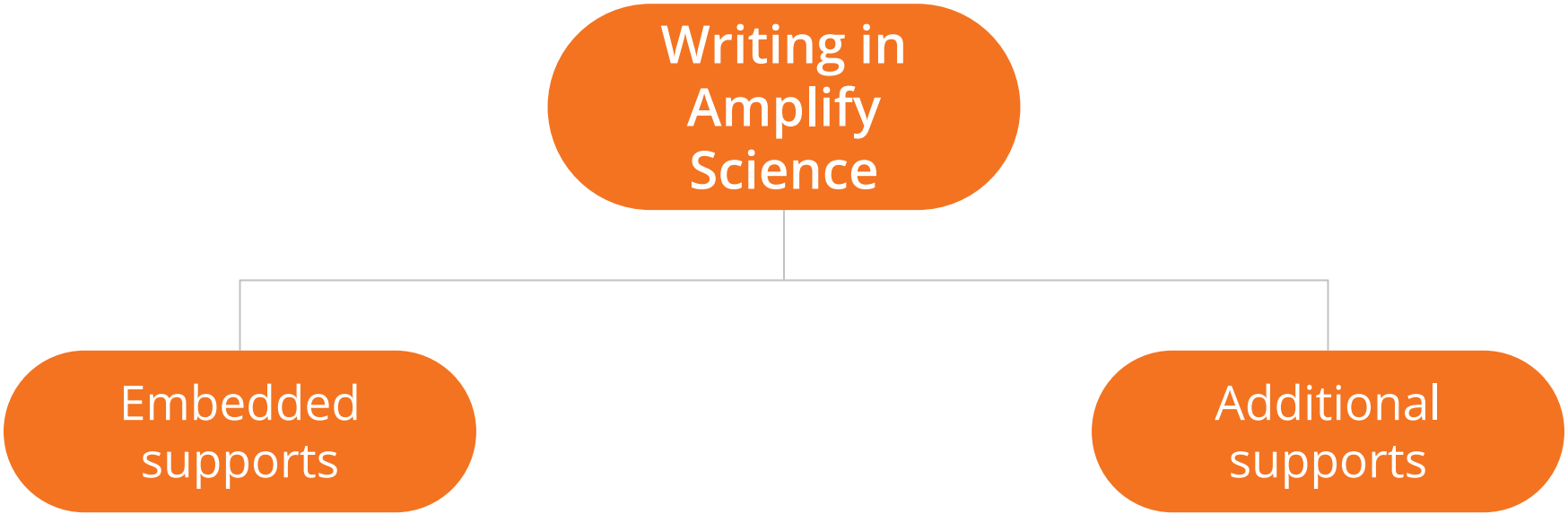
Plan for the day

- Introduction and framing
- **Writing in Amplify Science**
  - Writing as part of a multimodal experience
  - **Supporting students with writing**
  - Writing a culminating explanation or argument
  - Additional supports
- Model Lesson
- Planning
- Closing

What specific strategies are embedded into the curriculum to support students to write like scientists?



Supporting students with writing

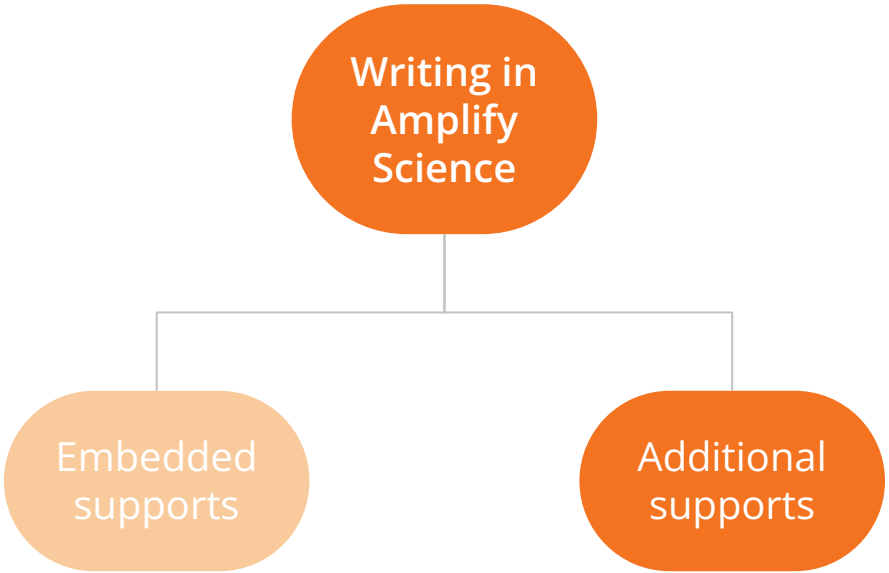


Embedded writing supports

- Smaller pieces of writing build to larger pieces of writing
- Informal talk opportunities: partners and small groups
- Sentence starters and/or language frames
- Classroom wall and other environmental print
- Word banks
- Discourse routines
- Multimodal instruction
- Gradual release of responsibility

Supporting students with writing

What additional strategies could you use to support students with writing in Amplify Science?



Additional supports

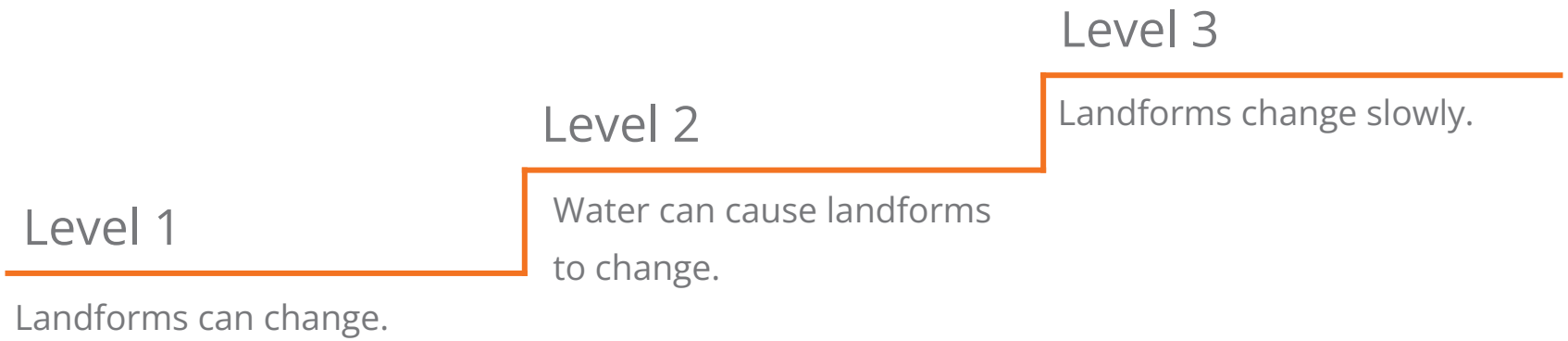
- Teacher support notes
- Possible Responses
- Differentiation notes
- Embedded Formative Assessments

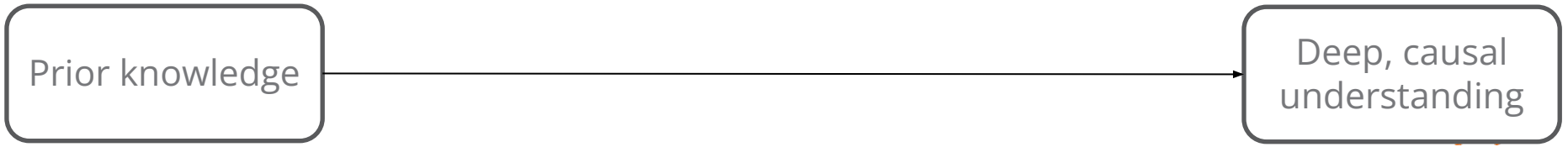
Plan for the day

- Introduction and framing
- **Writing in Amplify Science**
  - Writing as part of a multimodal experience
  - Supporting students with writing
  - **Writing a culminating explanation or argument**
  - Additional supports
- Model Lesson
- Planning
- Closing

Environments and Survival Progress Build

Assumed prior knowledge (preconceptions): Students are expected to have had some experiences with rock and understand that rock is hard and can be different sizes and shapes.





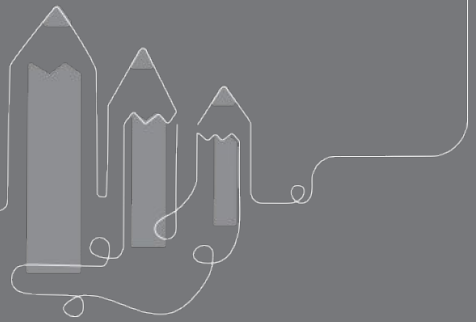
Writing Build in *Changing Landforms*

Ch. 4	Review guidelines	Writing a design argument using their knowledge and experiences from the previous chapters
Ch. 3	Review guidelines	Independent scientific explanation which includes more elements
Ch. 2	Review guidelines	Independent writing of scientific explanation
Ch. 1	Introduce guidelines	Shared writing of scientific explanation

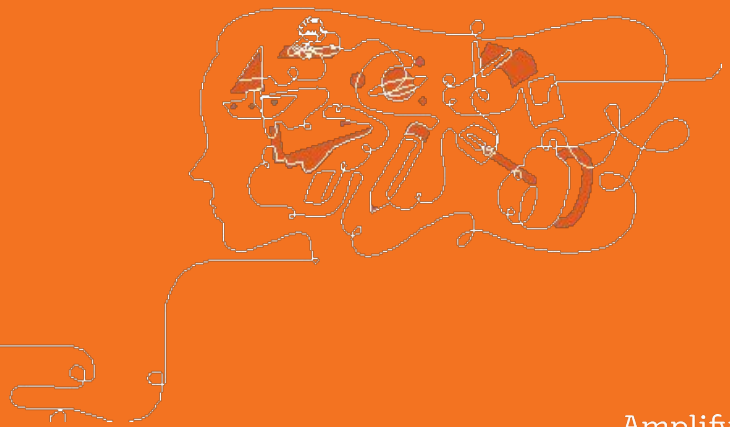
Key takeaway

Units leverage a **gradual release of responsibility model** for the formal writes.

As students work through a unit, their writing becomes more independent and sophisticated while the science content builds in complexity.



Scientific Explanations and Scientific Arguments



Share your ideas!

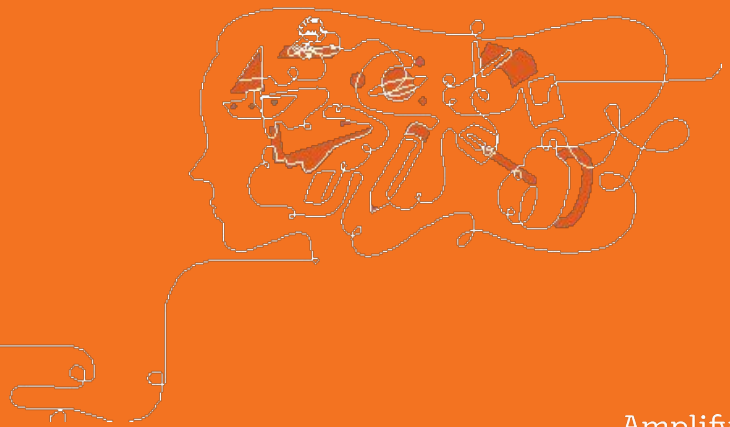
- **Question:** What do you think the difference is between a scientific explanation and a scientific argument?

An explanation describes to an audience **the invisible mechanisms or causes** that led to a phenomena.	An argument is to convince an audience that a **claim** (which is usually about how or why something happens) **is the best claim** given what we know.

Explanations and Arguments

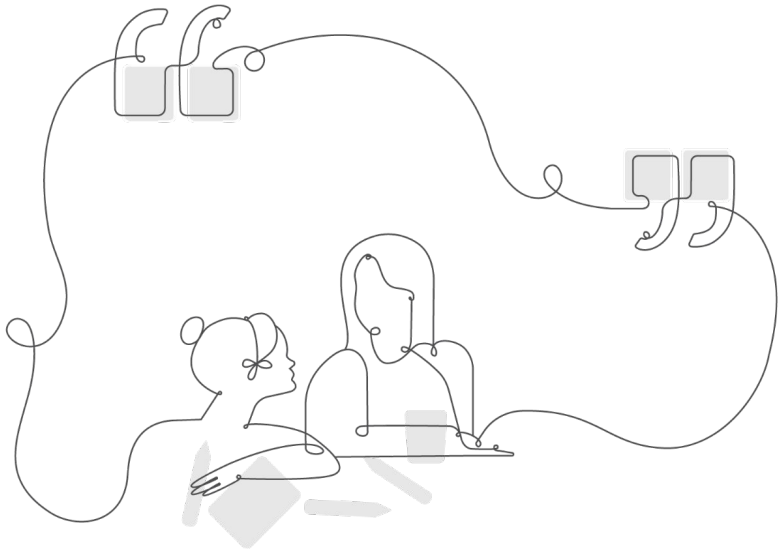
Explanation Guidelines:	**Argument Guidelines:**
1. It answers a question about how or why something happens. 2. It is based on the ideas you have learned from investigations and text. 3. It describes things that are not easy to observe. 4. It uses scientific language. 5. It is written for an audience.	1. It answers a question with a claim about the natural world. 2. It includes evidence to support the claim. Evidence can be data and ideas. 3. It connects the evidence to the claim by linking different pieces of evidence together to show how they support the claim. 4. It uses scientific language. 5. It is written for an audience.

End-of-Unit Writing: Explanations or Arguments



Quick poll

Have you explored the End-of-Unit Assessment Guide for any Amplify Science units?



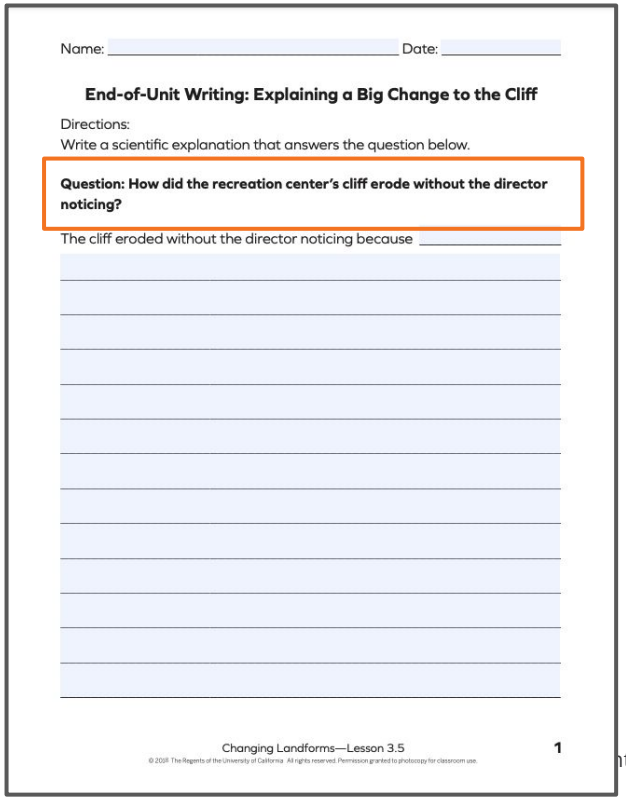
Rubrics for Assessing Students' Final Written Arguments

Three-dimensional

- Rubric 1: Assessing Students' Understanding of Science Concepts (DCIs) — summative
- Rubric 2: Assessing Students' Understanding of the Crosscutting Concept of Cause and Effect — formative (K-1) summative (2-5)
- Rubric 3: Assessing Students' Performance of the Practice of Constructing Scientific Arguments — formative

Lesson 3.5: End-of-Unit Writing (Part 1)

Write Explanations and Create Diagrams



Name: _____ Date: _____

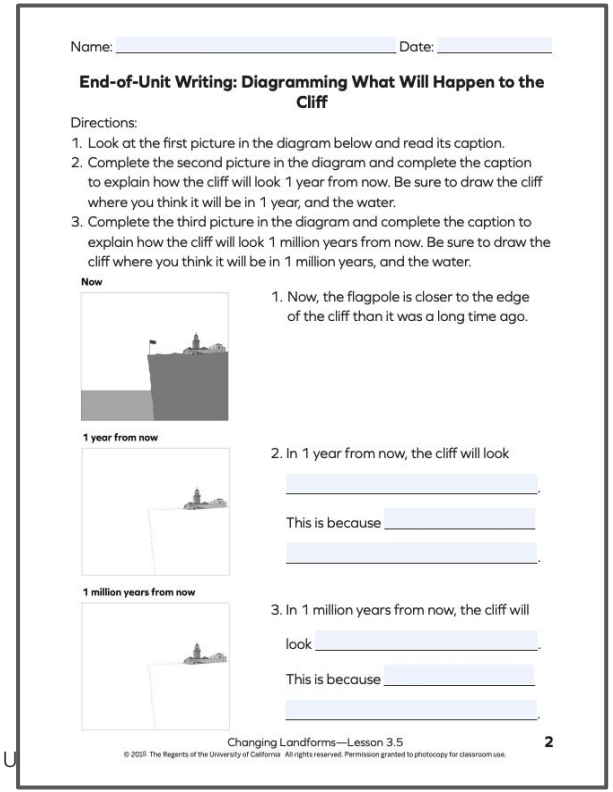
End-of-Unit Writing: Explaining a Big Change to the Cliff

Directions:
Write a scientific explanation that answers the question below.

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

The cliff eroded without the director noticing because _____

Changing Landforms—Lesson 3.5 1



Name: _____ Date: _____

End-of-Unit Writing: Diagramming What Will Happen to the Cliff

Directions:
1. Look at the first picture in the diagram below and read its caption.
2. Complete the second picture in the diagram and complete the caption to explain how the cliff will look 1 year from now. Be sure to draw the cliff where you think it will be in 1 year, and the water.
3. Complete the third picture in the diagram and complete the caption to explain how the cliff will look 1 million years from now. Be sure to draw the cliff where you think it will be in 1 million years, and the water.

Now

1. Now, the flagpole is closer to the edge of the cliff than it was a long time ago.

1 year from now

2. In 1 year from now, the cliff will look _____.
This is because _____.

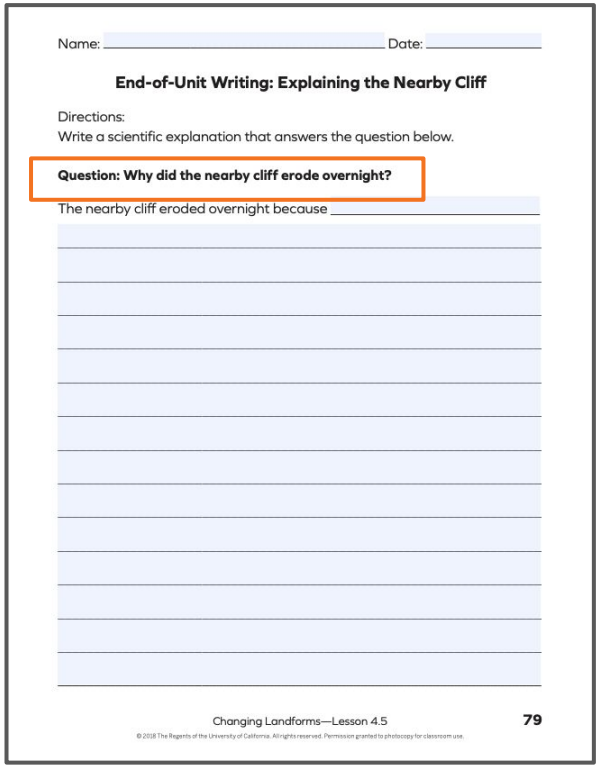
1 million years from now

3. In 1 million years from now, the cliff will look _____.
This is because _____.

Changing Landforms—Lesson 3.5 2

Lesson 4.5: End-of-Unit Writing (Part II)

Write Explanations and Create Diagrams - Application



Name: _____ Date: _____

End-of-Unit Writing: Explaining the Nearby Cliff

Directions:
Write a scientific explanation that answers the question below.

Question: Why did the nearby cliff erode overnight?

The nearby cliff eroded overnight because _____

Changing Landforms—Lesson 4.5 **79**

Why did the nearby cliff erode overnight?

Work time: End of unit Assessment Guide

Become familiar with your EOU Assessment Guide

- What is the prompt for students? (check in the Assessment Guide and in the lesson activity itself)
- What does each rubric assess?

Reflection prompt:

- How could the EOU Assessment Guide help your planning and instruction throughout the unit?

Key takeaway

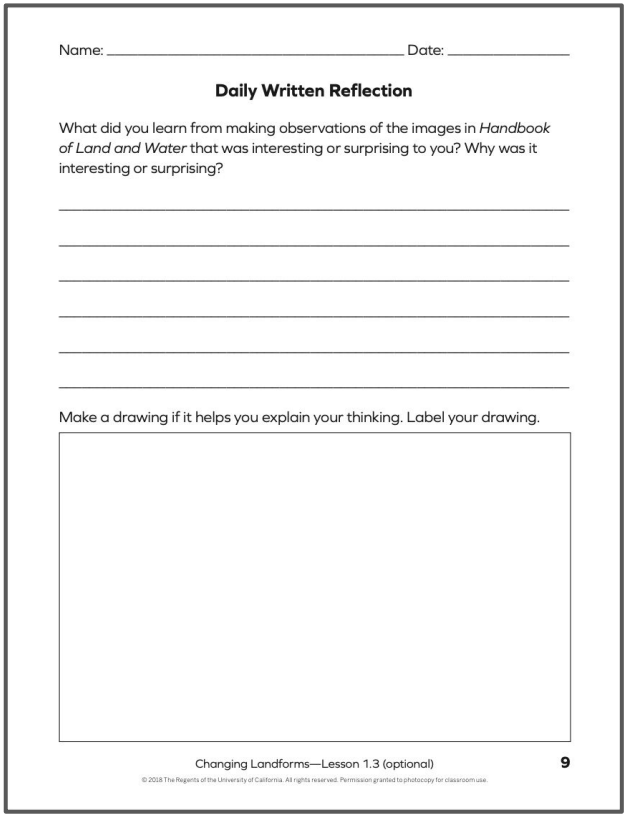
Different writing activities play different roles within the curriculum.

Providing support for writing will look different depending on the activity.

Plan for the day

- Introduction and framing
- **Writing in Amplify Science**
  - Writing as part of a multimodal experience
  - Supporting students with writing
  - Writing a culminating explanation or argument
  - **Additional supports**
- Model Lesson
- Planning
- Closing

Supplemental Investigation Notebook Pages



Name: _____ Date: _____

Daily Written Reflection

What did you learn from making observations of the images in *Handbook of Land and Water* that was interesting or surprising to you? Why was it interesting or surprising?

_____

_____

_____

_____

_____

_____

Make a drawing if it helps you explain your thinking. Label your drawing.

Changing Landforms—Lesson 1.3 (optional) 9

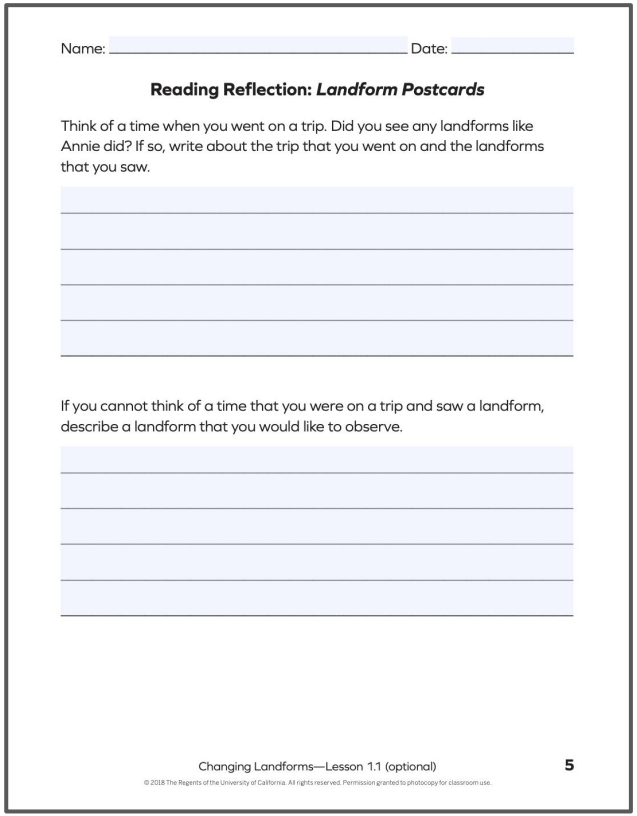
Daily Written Reflections

Example question and prompt:

- What did you learn from making observations of the images in Handbook of Land and Water that was interesting or surprising to you? Why was it interesting or surprising?

- Make a drawing if it helps you explain your thinking. Label your drawing.

Supplemental Investigation Notebook Pages



Name: _____ Date: _____

Reading Reflection: *Landform Postcards*

Think of a time when you went on a trip. Did you see any landforms like Annie did? If so, write about the trip that you went on and the landforms that you saw.

If you cannot think of a time that you were on a trip and saw a landform, describe a landform that you would like to observe.

Changing Landforms—Lesson 1.1 (optional) 5

Reading Reflections

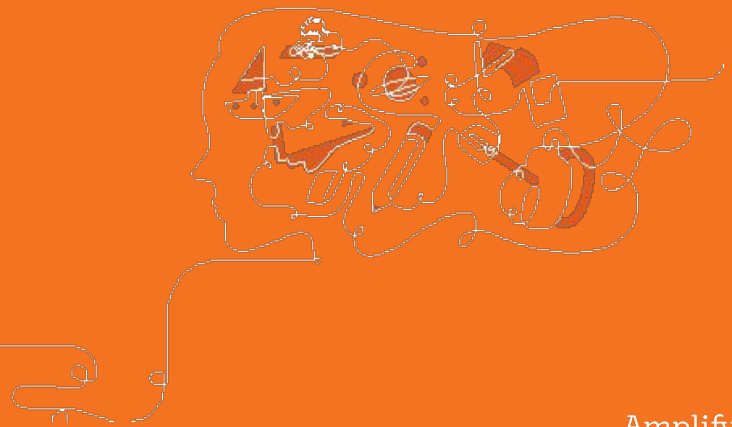
Think of a time when you went on a trip. Did you see any landforms like Annie did? If so, write about the trip that you went on and the landforms that you saw.

If you cannot think of a time that you were on a trip and saw a landform, describe a landform that you would like to observe.

Key takeaway

In addition to the embedded supports for student writing, there are resources throughout the curriculum you can use to provide additional support.

Lunch Break



Grade 3, Unit 3: Part 1 & 2 Resources

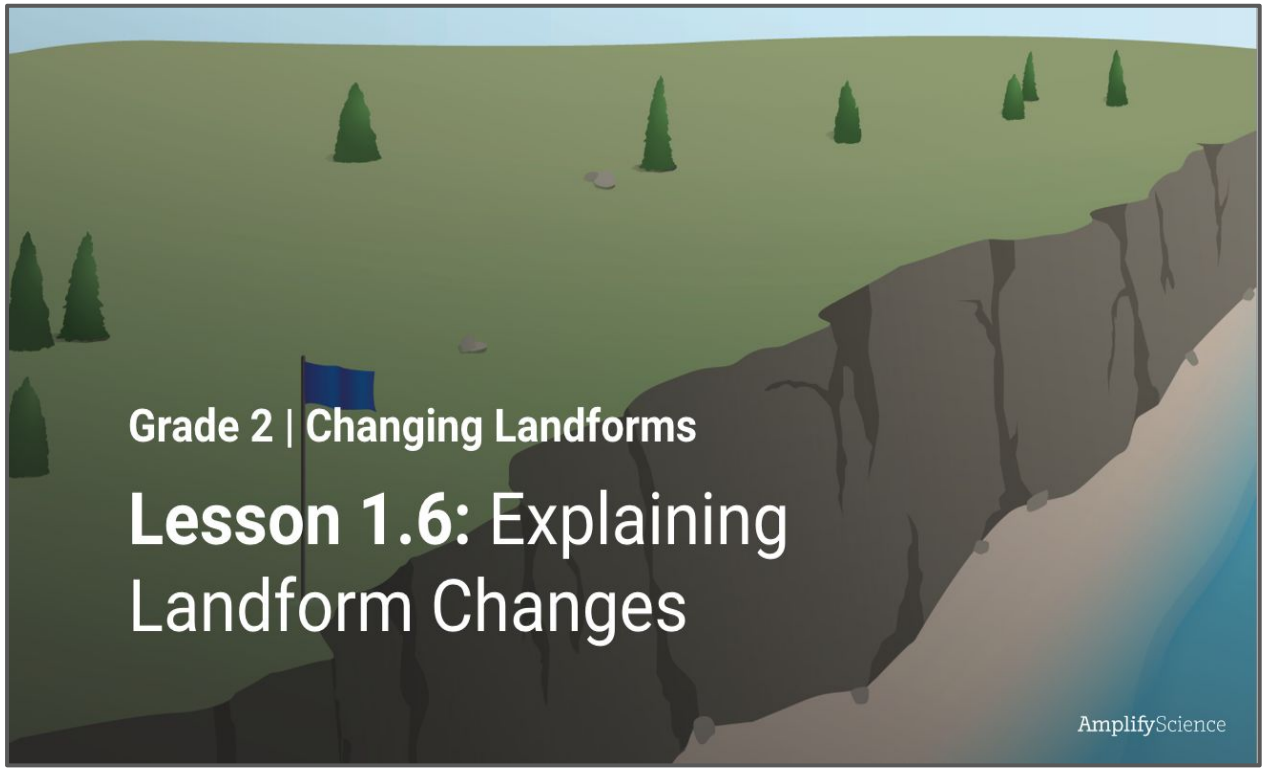
https://bit.ly/3WAYJzO

Plan for the day

- Introduction and framing
- Writing in Amplify Science
  - Writing as part of a multimodal experience
  - Supporting students with writing
  - Writing a culminating explanation or argument
  - Additional supports
- **Model Lesson**
- Planning
- Closing

Unpacking the lesson

First, let's look at what we need to do before engaging in the lesson.

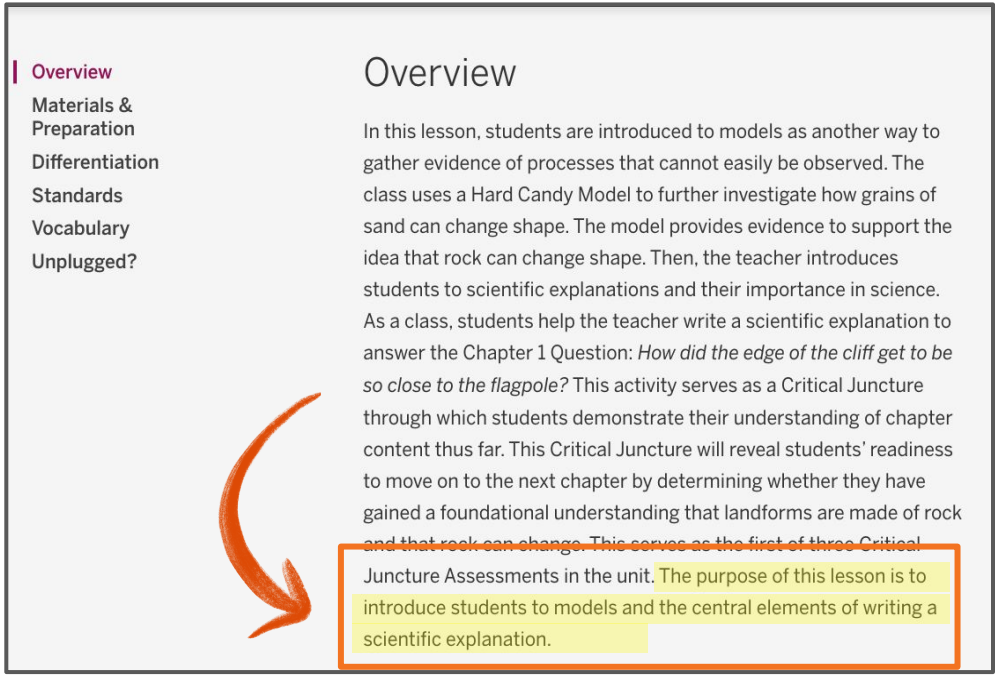


Focusing on lesson's purpose

Teacher tip: Use the Lesson Overview to get a big picture of the lesson and its learning sequence.

Teacher tip: The purpose statement highlights the main reason for the lesson.

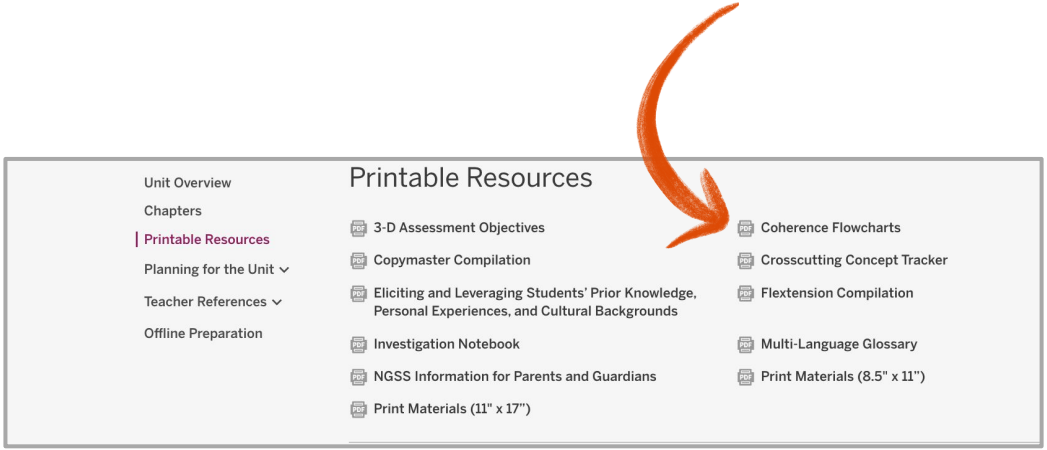
Reflection: How might the lesson purpose statement help you when you're planning?



Printable Resources

Coherence Flowcharts

- Navigate to Printable Resources on the Unit Landing Page
  - Open the Coherence Flowchart



Changing Landforms: The Disappearing Cliff

Unit Anchor Phenomenon

Problem students work to solve

The cliff where Oceanside Recreation Center is situated appears to be receding.
Why is the edge of the ocean cliff closer to the flagpole than it used to be?

Chapter-level Anchor Phenomenon
Chapter 1 Question

The flagpole is closer to the edge of the ocean cliff than it used to be.
How did the edge of the cliff get to be so close to the flagpole?

Investigation Questions

What are landforms made of? (1.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

How do geologists figure out how something changed when they can't observe it changing? (1.3-1.6)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

Evidence sources and reflection opportunities

- Read *Landform Postcards* (1.1)
- Discuss and record ideas about landforms on Anticipatory Chart (1.2)
- Observe landforms in *Handbook of Land and Water* (1.2)
- Return to Anticipatory Chart and revise ideas (1.2)

- Observe sand samples and generate questions about sand (1.3)
- Compare sand samples (1.3)
- Read *Gary's Sand Journal* (1.4)
- Observe a mystery sand (1.4)
- Use evidence from observations of sand samples as evidence for how the sand got to be the way it is (1.5)
- Write and share explanations about sand samples (1.5)
- Use Hard Candy Model to gather evidence that sand and rock can change shape (1.6)

Key concepts

- Landforms are made of rock. (1.2)

- Even if geologists can't see a change happening, they can use models to visualize how it may have happened. (1.6)
- Even though rock is hard, it can change shape. (1.6)

Application of key concepts to problem

- Write an explanation as a class to answer the Chapter 1 Question (1.6)

Explanation that students can make to answer the Chapter 1 Question

The shape of the cliff changed when the rock it is made of changed.

Amplify.

Unit Anchor Phenomenon

Problem students work to solve

Changing Landforms: The Disappearing Cliff

The cliff where Oceanside Recreation Center is situated appears to be receding.
Why is the edge of the ocean cliff closer to the flagpole than it used to be?

Chapter-level Anchor Phenomenon
Chapter 1 Question

The flagpole is closer to the edge of the ocean cliff than it used to be.
How did the edge of the cliff get to be so close to the flagpole?

Investigation Questions

What are landforms made of? (1.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

How do geologists figure out how something changed when they can't observe it changing? (1.3-1.6)
(Note: See Lesson Overviews for lesson-level Investigative

- Read *Landform Postcards* (1.1)
- Discuss and record ideas about landforms on Anticipatory Chart (1.2)
- Observe landforms in *Handbook of Land and Water* (1.2)
- Return to Anticipatory Chart and revise ideas (1.2)

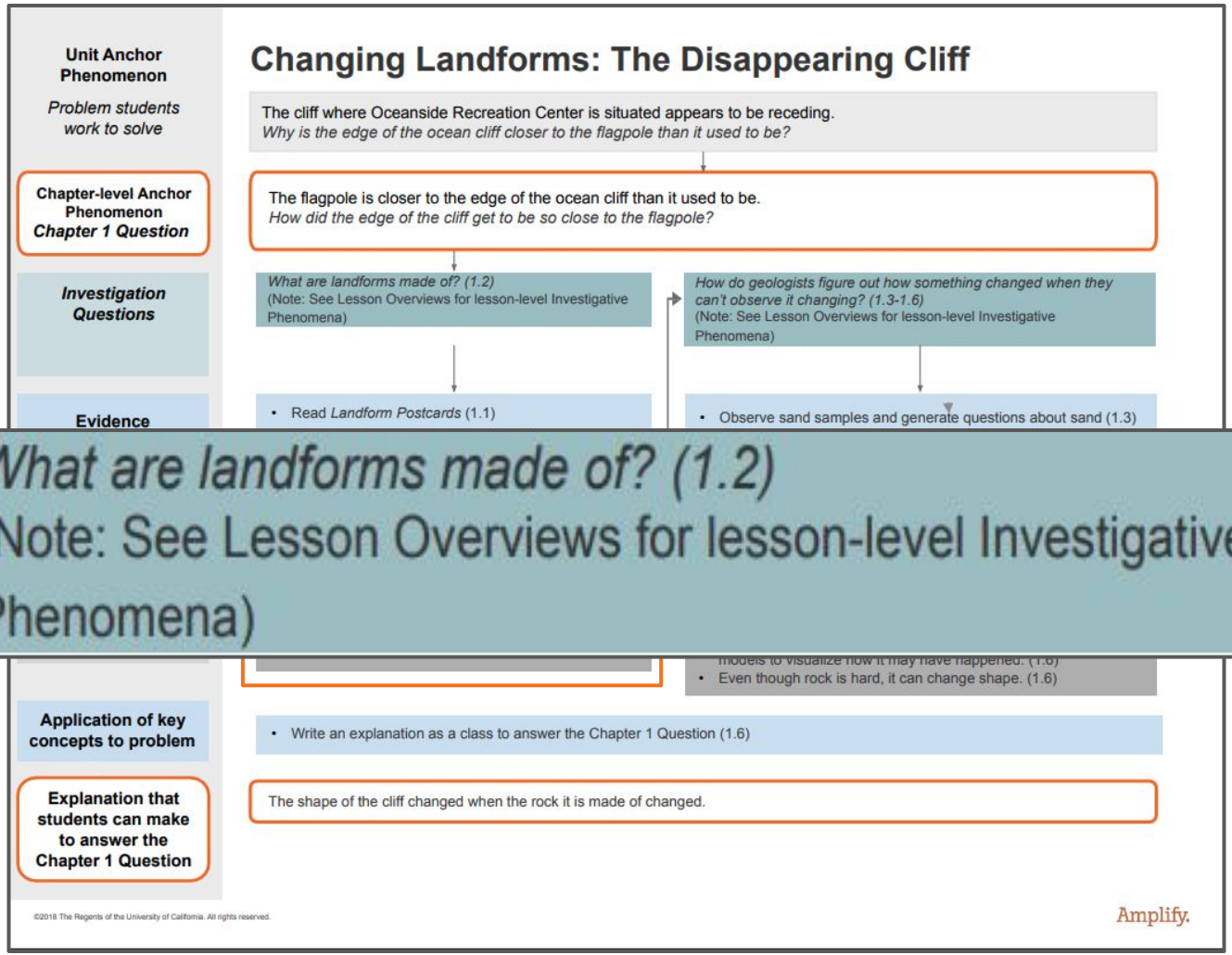
concepts to problem

- Write an explanation as a class to answer the Chapter 1 Question (1.6)

Explanation that students can make to answer the Chapter 1 Question

The shape of the cliff changed when the rock it is made of changed.

Amplify.



What are landforms made of? (1.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

Unit Anchor Phenomenon

Problem students work to solve

Changing Landforms: The Disappearing Cliff

The cliff where Oceanside Recreation Center is situated appears to be receding.
Why is the edge of the ocean cliff closer to the flagpole than it used to be?

- Observe sand samples and generate questions about sand (1.3)
- Compare sand samples (1.3)
- Read *Gary's Sand Journal* (1.4)
- Observe a mystery sand (1.4)
- Use evidence from observations of sand samples as evidence for how the sand got to be the way it is (1.5)
- Write and share explanations about sand samples (1.5)
- Use Hard Candy Model to gather evidence that sand and rock can change shape (1.6)

Formative Assessments: Monitoring Students Progress

Preparing Students For Lesson 1.6

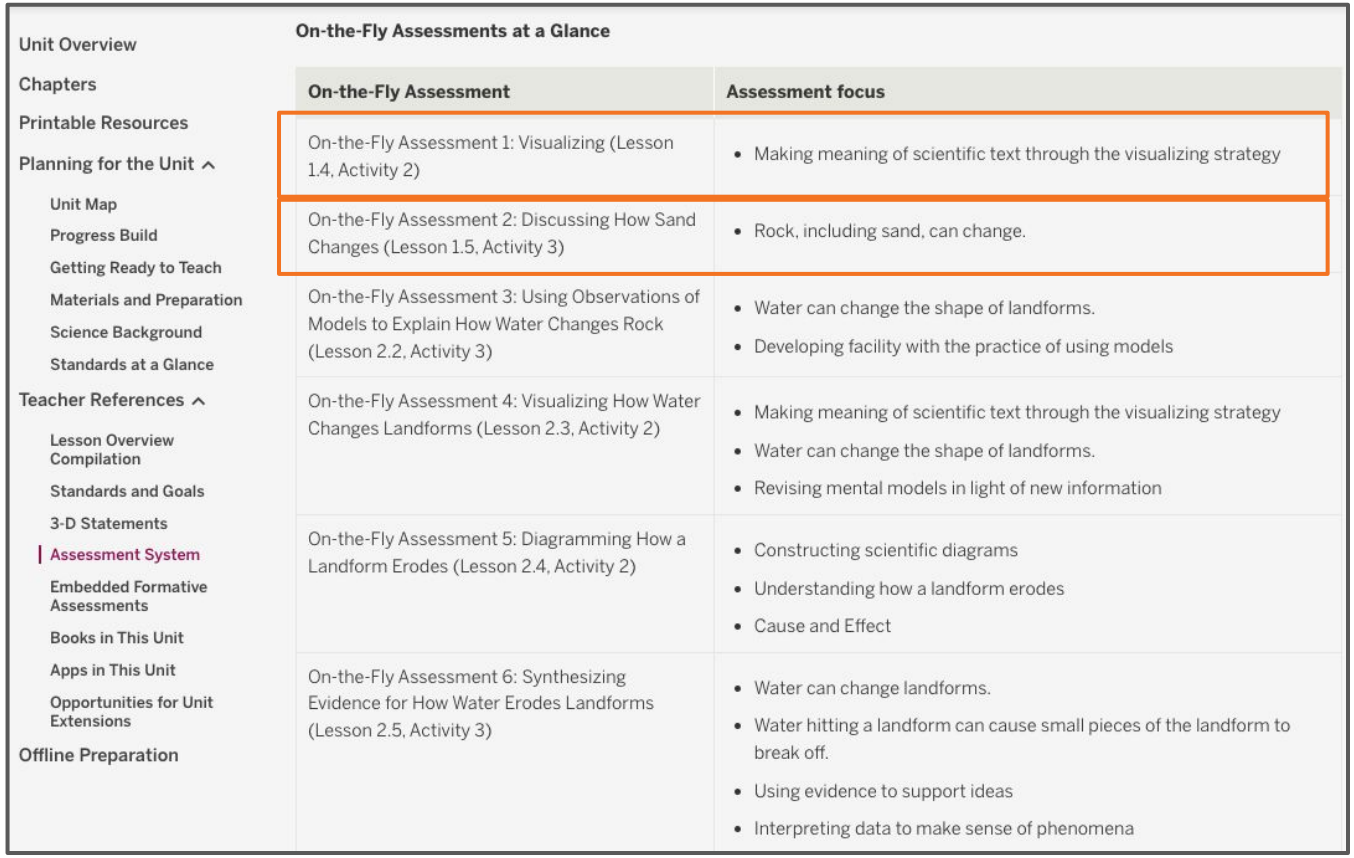
On-the-Fly Assessments

Lesson 1.4, Activity 2

- Making meaning of scientific text through the visualizing strategy

Lesson 1.5, Activity 3

- Rock, including sand can change



Unit Overview
Chapters
Printable Resources
Planning for the Unit
- 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
- Opportunities for Unit Extensions

Offline Preparation

On-the-Fly Assessments at a Glance

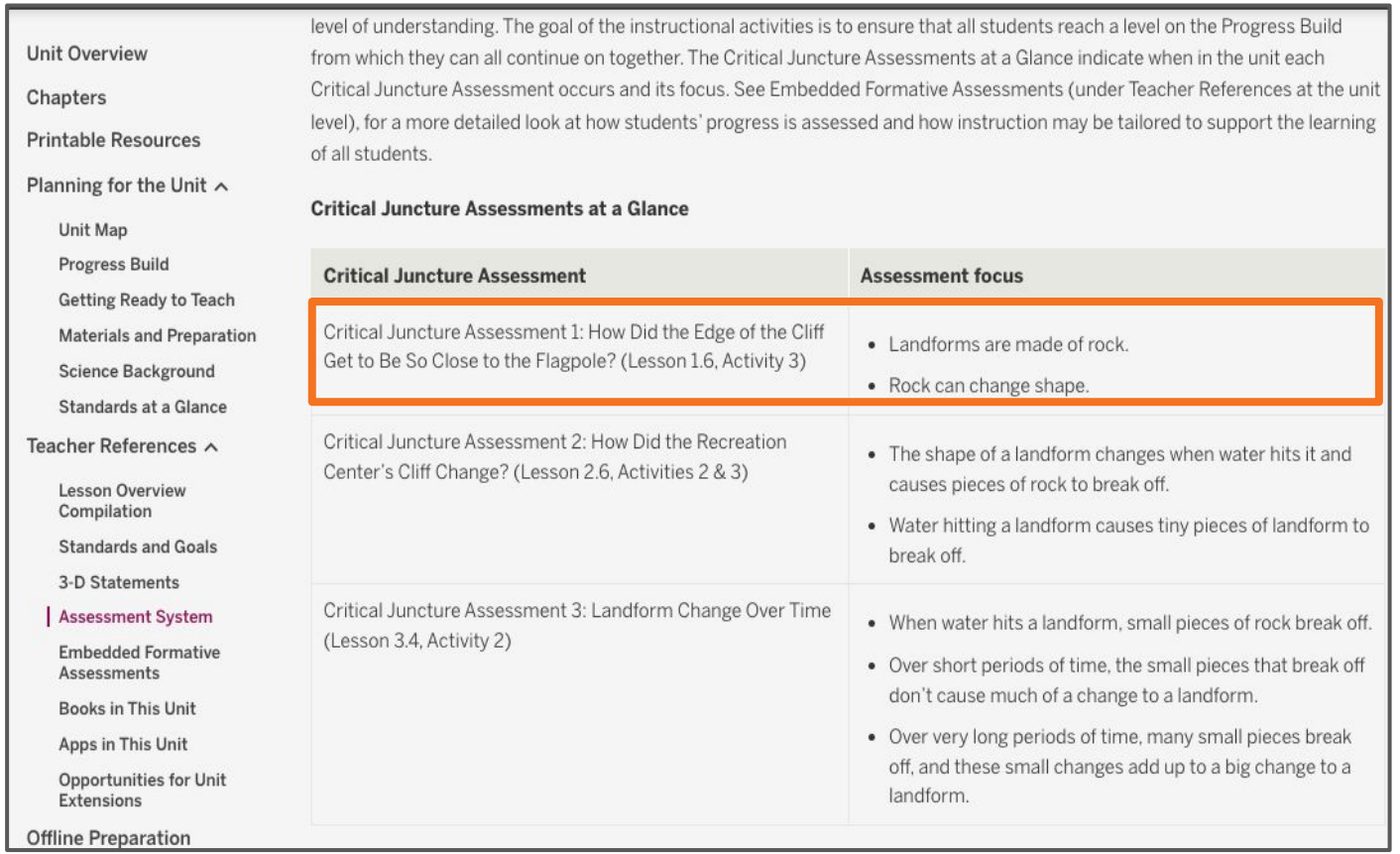
On-the-Fly Assessment	Assessment focus
On-the-Fly Assessment 1: Visualizing (Lesson 1.4, Activity 2)	• Making meaning of scientific text through the visualizing strategy
On-the-Fly Assessment 2: Discussing How Sand Changes (Lesson 1.5, Activity 3)	• Rock, including sand, can change.
On-the-Fly Assessment 3: Using Observations of Models to Explain How Water Changes Rock (Lesson 2.2, Activity 3)	• Water can change the shape of landforms. • Developing facility with the practice of using models
On-the-Fly Assessment 4: Visualizing How Water Changes Landforms (Lesson 2.3, Activity 2)	• Making meaning of scientific text through the visualizing strategy • Water can change the shape of landforms. • Revising mental models in light of new information
On-the-Fly Assessment 5: Diagramming How a Landform Erodes (Lesson 2.4, Activity 2)	• Constructing scientific diagrams • Understanding how a landform erodes • Cause and Effect
On-the-Fly Assessment 6: Synthesizing Evidence for How Water Erodes Landforms (Lesson 2.5, Activity 3)	• Water can change landforms. • Water hitting a landform can cause small pieces of the landform to break off. • Using evidence to support ideas • Interpreting data to make sense of phenomena

Formative Assessments: Monitoring Students Progress

Lesson 1.6, Act. 3

Critical Juncture Assessments

- Landforms are made of rock.
- Rock can change shape.



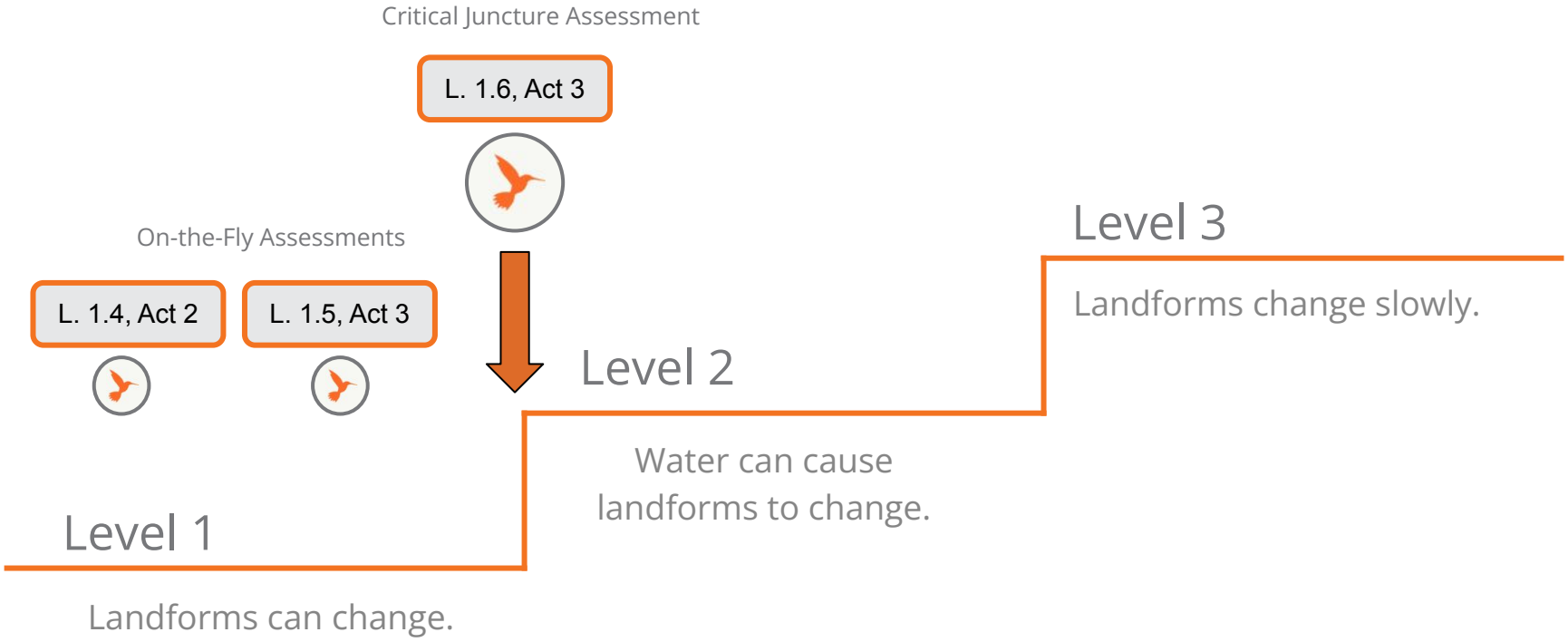
Unit Overview
Chapters
Printable Resources
Planning for the Unit
Unit Map
Progress Build
Getting Ready to Teach
Materials and Preparation
Science Background
Standards at a Glance
Teacher References
Lesson Overview Compilation
Standards and Goals
3-D Statements
Assessment System
Embedded Formative Assessments
Books in This Unit
Apps in This Unit
Opportunities for Unit Extensions
Offline Preparation

level of understanding. The goal of the instructional activities is to ensure that all students reach a level on the Progress Build from which they can all continue on together. The Critical Juncture Assessments at a Glance indicate when in the unit each Critical Juncture Assessment occurs and its focus. See Embedded Formative Assessments (under Teacher References at the unit level), for a more detailed look at how students' progress is assessed and how instruction may be tailored to support the learning of all students.

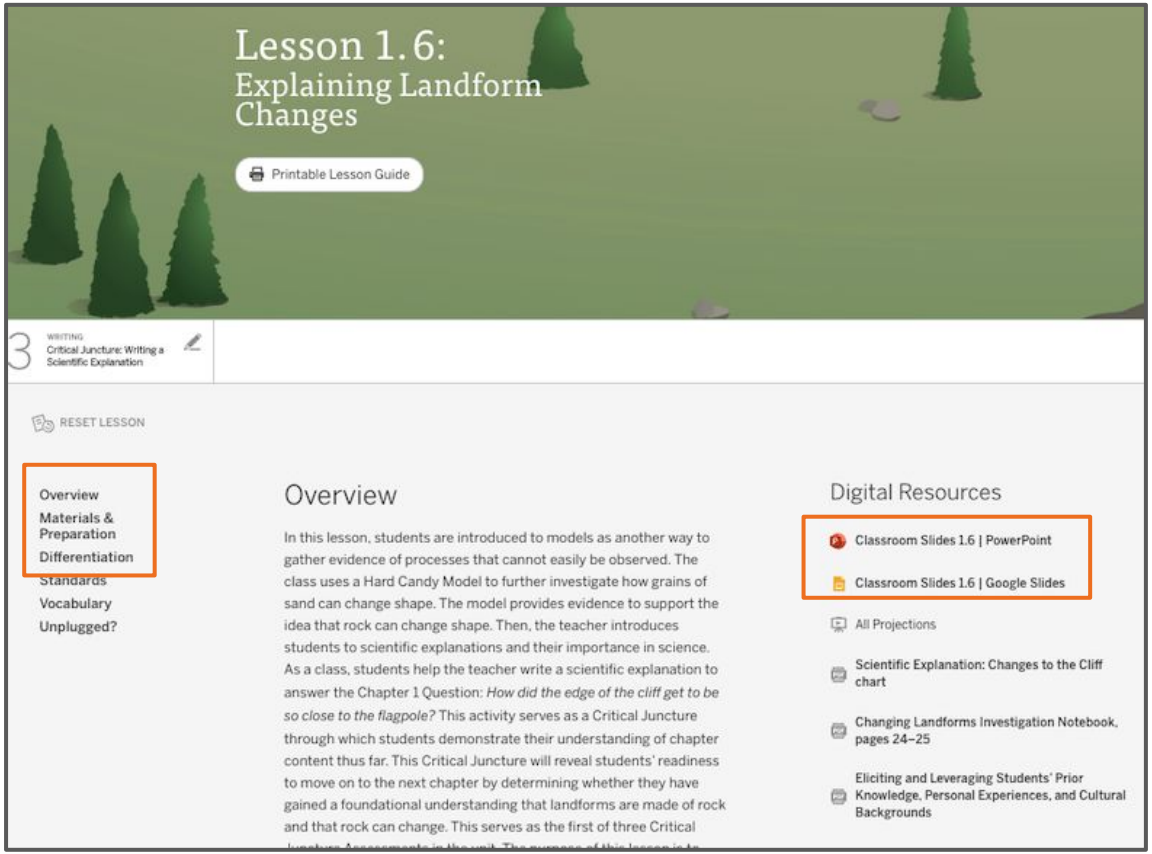
Critical Juncture Assessments at a Glance

Critical Juncture Assessment	Assessment focus
Critical Juncture Assessment 1: How Did the Edge of the Cliff Get to Be So Close to the Flagpole? (Lesson 1.6, Activity 3)	• Landforms are made of rock. • Rock can change shape.
Critical Juncture Assessment 2: How Did the Recreation Center's Cliff Change? (Lesson 2.6, Activities 2 & 3)	• The shape of a landform changes when water hits it and causes pieces of rock to break off. • Water hitting a landform causes tiny pieces of landform to break off.
Critical Juncture Assessment 3: Landform Change Over Time (Lesson 3.4, Activity 2)	• When water hits a landform, small pieces of rock break off. • Over short periods of time, the small pieces that break off don't cause much of a change to a landform. • Over very long periods of time, many small pieces break off, and these small changes add up to a big change to a landform.

Monitoring Students Progress: On-the-Fly and Critical Juncture



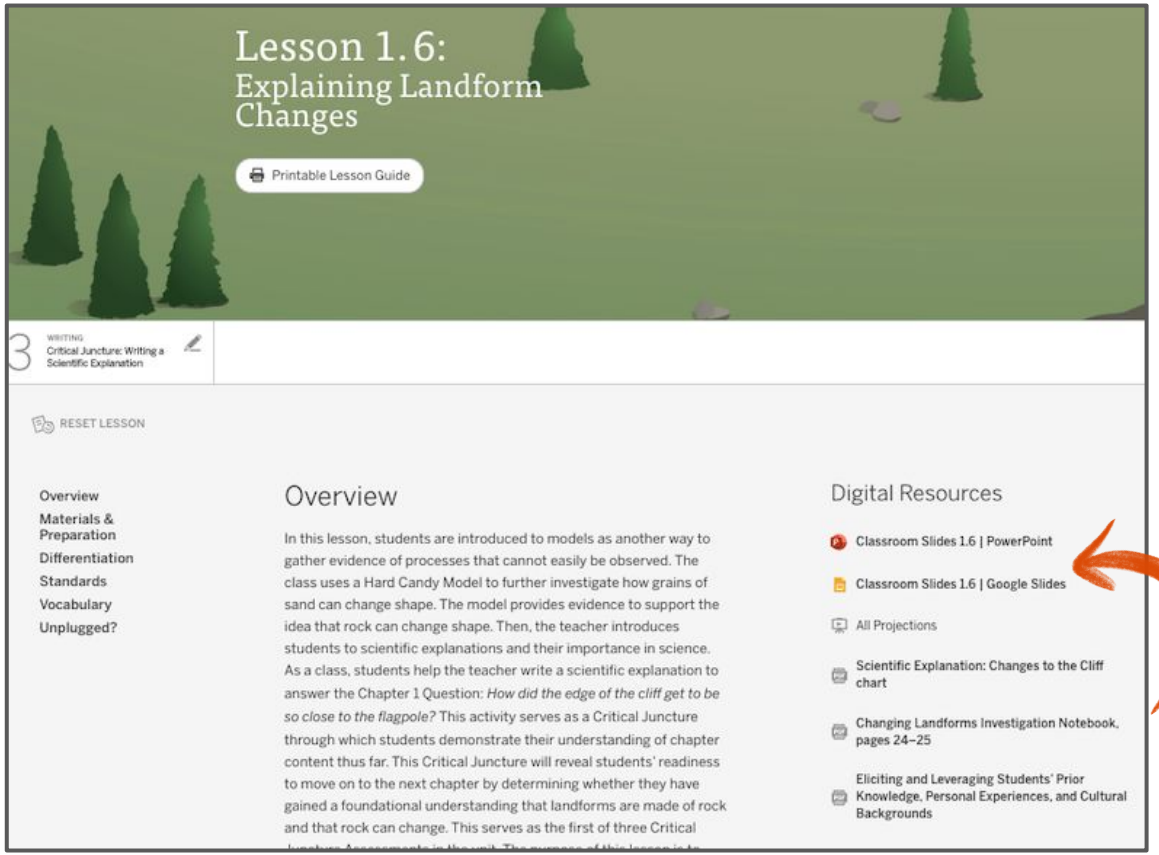
Planning Lesson 1.6



Planning Lesson 1.6

Lesson Brief

Step 1: Download the **Classroom Slides** and review them.



Planning Lesson 1.6

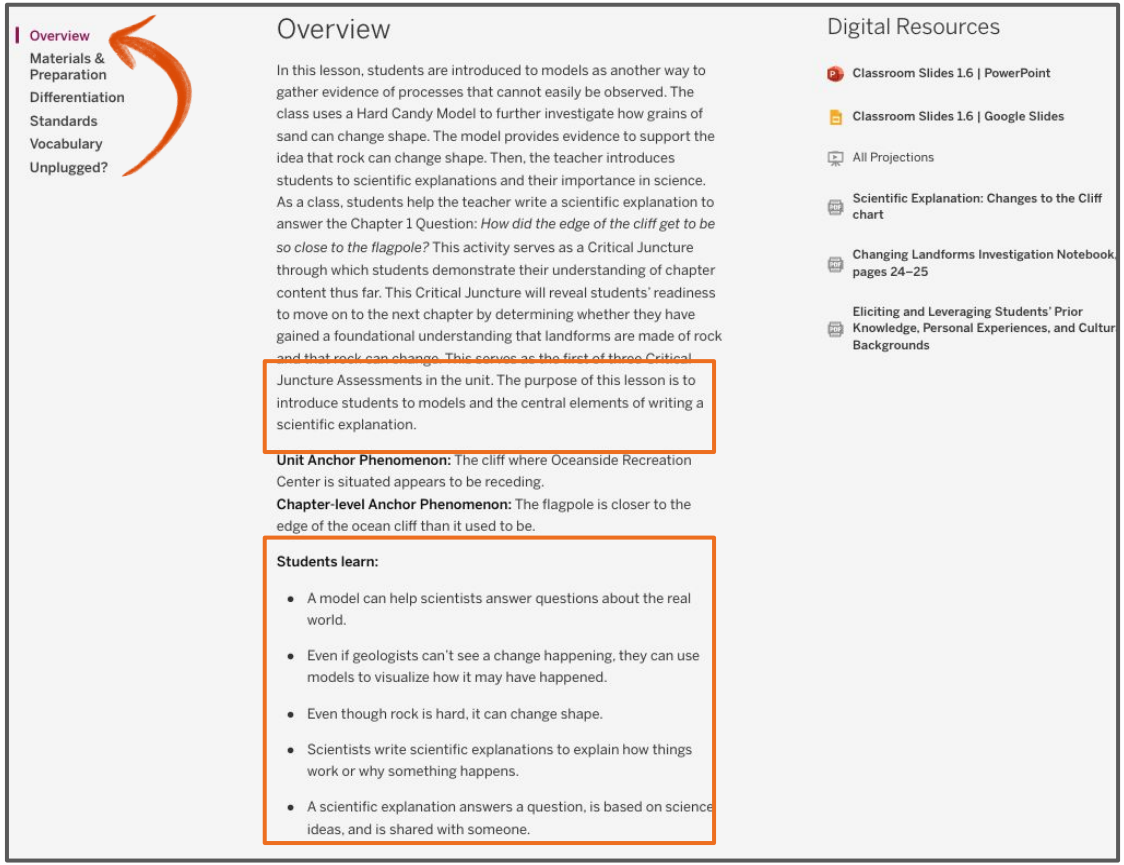
Lesson Brief

Step 2: Read the **Overview.**

The Purpose of this Lesson: To introduce students to models and the central elements of writing a scientific explanation.

Learning Objectives:

- A model can help scientists answer questions about the real world.
- Even if geologists can't see a change happening, they can use models to visualize how it may have happened.
- Even though rock is hard, it can change shape.
- Scientists write scientific explanations to explain how things work or why something happens.
- A scientific explanation answers a question, is based on science ideas, and is shared with someone.



Overview
Materials & Preparation
Differentiation
Standards
Vocabulary
Unplugged?

Overview

In this lesson, students are introduced to models as another way to gather evidence of processes that cannot easily be observed. The class uses a Hard Candy Model to further investigate how grains of sand can change shape. The model provides evidence to support the idea that rock can change shape. Then, the teacher introduces students to scientific explanations and their importance in science. As a class, students help the teacher write a scientific explanation to answer the Chapter 1 Question: *How did the edge of the cliff get to be so close to the flagpole?* This activity serves as a Critical Juncture through which students demonstrate their understanding of chapter content thus far. This Critical Juncture will reveal students' readiness to move on to the next chapter by determining whether they have gained a foundational understanding that landforms are made of rock and that rock can change. This serves as the first of three Critical Juncture Assessments in the unit. The purpose of this lesson is to introduce students to models and the central elements of writing a scientific explanation.

Unit Anchor Phenomenon: The cliff where Oceanside Recreation Center is situated appears to be receding.
Chapter-level Anchor Phenomenon: The flagpole is closer to the edge of the ocean cliff than it used to be.

Students learn:

- A model can help scientists answer questions about the real world.
- Even if geologists can't see a change happening, they can use models to visualize how it may have happened.
- Even though rock is hard, it can change shape.
- Scientists write scientific explanations to explain how things work or why something happens.
- A scientific explanation answers a question, is based on science ideas, and is shared with someone.

Digital Resources

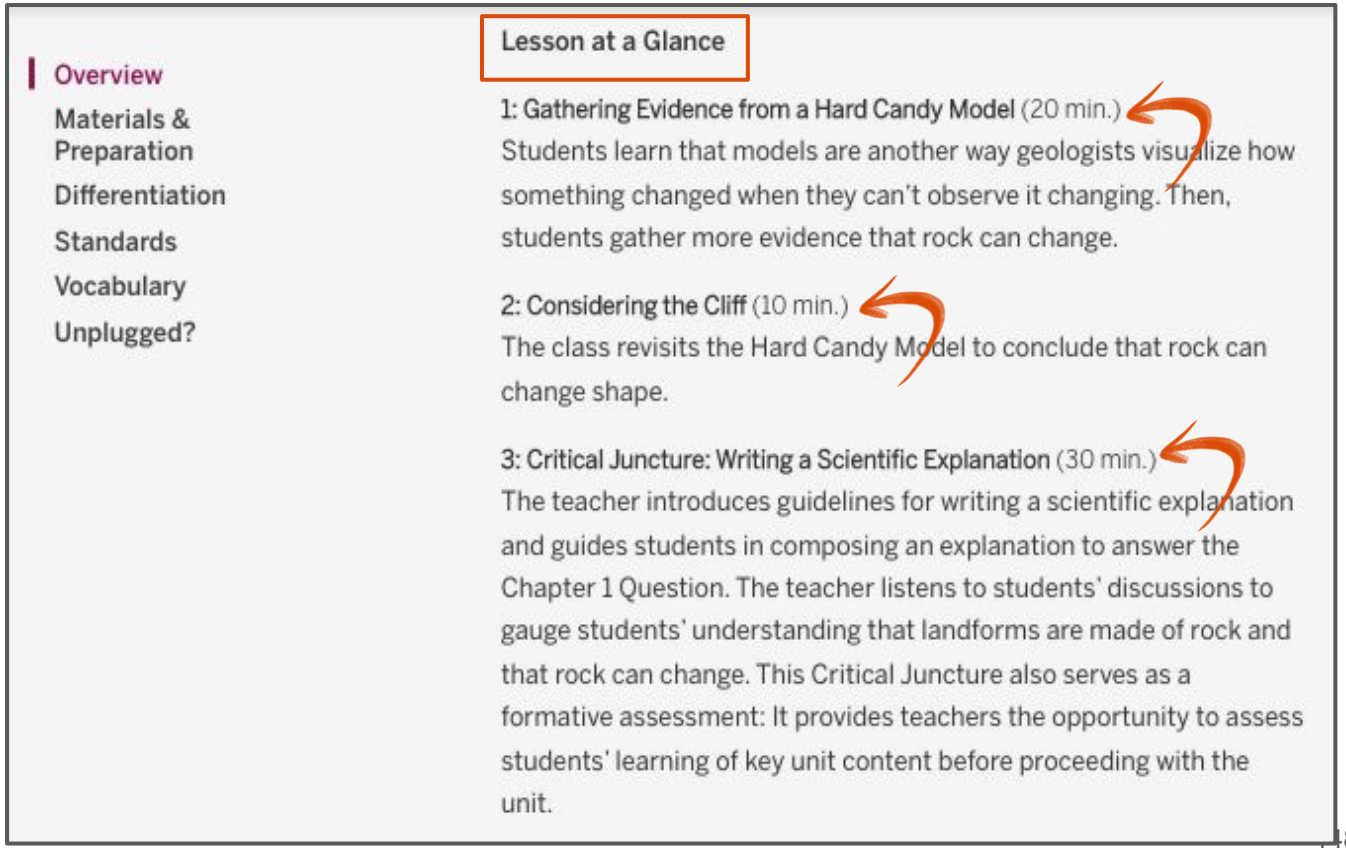
Classroom Slides 1.6 | PowerPoint
Classroom Slides 1.6 | Google Slides
All Projections
Scientific Explanation: Changes to the Cliff chart
Changing Landforms Investigation Notebook, pages 24–25
Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultur Backgrounds

Quick check:
Lesson timing and pacing

How much time do you have in your schedule for each science lesson?

Lesson at a Glance: Pacing

- Are there activities that might take slightly more or less time?
- Should you split the lesson over two days?



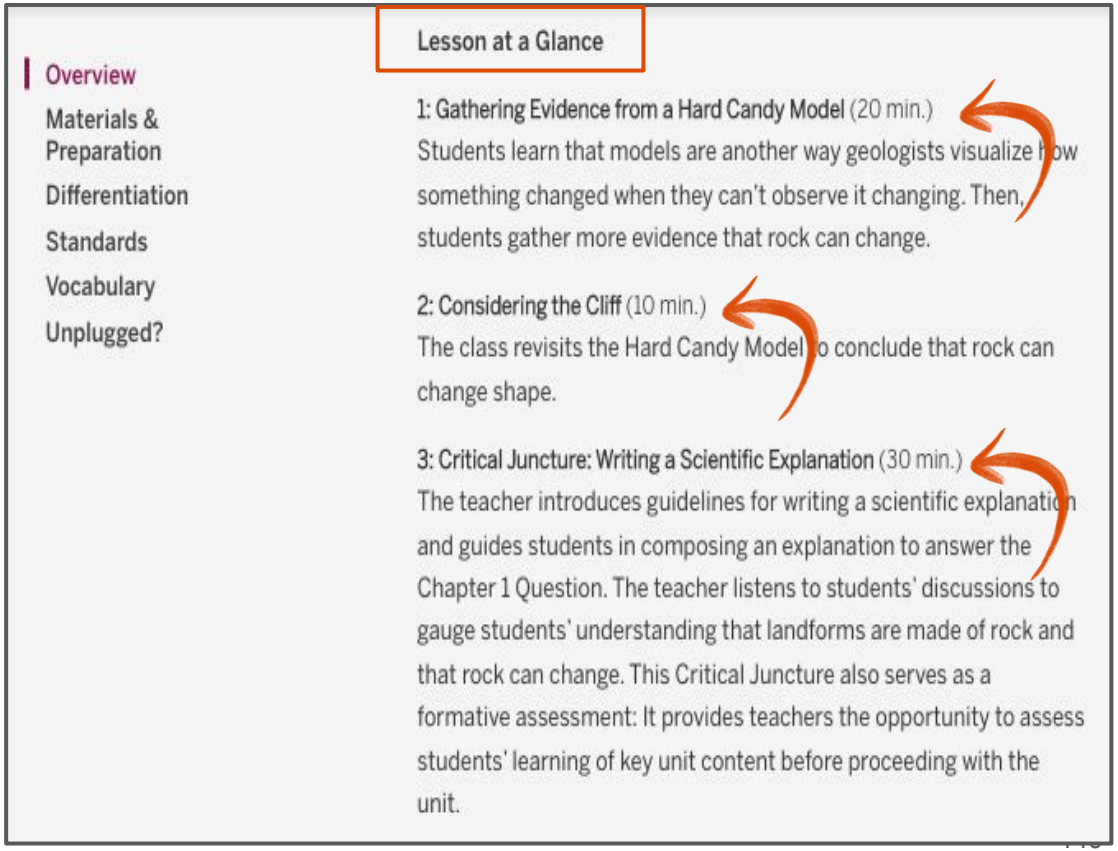
Lesson at a Glance: Pacing

Day 1: (30 minutes)

Act 1: Gathering Evidence from a Hard Candy Model (20 min)
Act 2: Considering the Cliff (10 min)

Day 2: (35 minutes)

Act 3: Critical Juncture: Writing a Scientific Explanation (30 min)



Planning for Pacing - Changing Landforms (Example)

Sample time in my Science block.	Day 1 (30 min)	Day 2 (35 min)	Day 3 (30 min)	Day 4 (40 min)	Day 5 (35 min)
	1.6: Explaining Landform Changes Activity 1: Gathering Evidence from a Hard Candy Model (20 min.) Activity 2: Considering the Cliff (10 min)	**1.6: cont.** Activity 3: Critical Juncture: Writing a Scientific Explanation (30 min.)	**2.1 Diagramming Landform Changes** Activity 1: Returning to the Cliff (10 min.) Activity 2: Diagramming Landform Changes (20 min)	**2.1 cont.** Activity 3: Observing Landform Changes (30 min) **2.2: Modeling Landform Changes** Activity 1: Considering How Water Changes Landforms (10 min)	**2.2: cont.** Activity 2: Modeling Landform Changes (35 min)

Week 1 Pacing

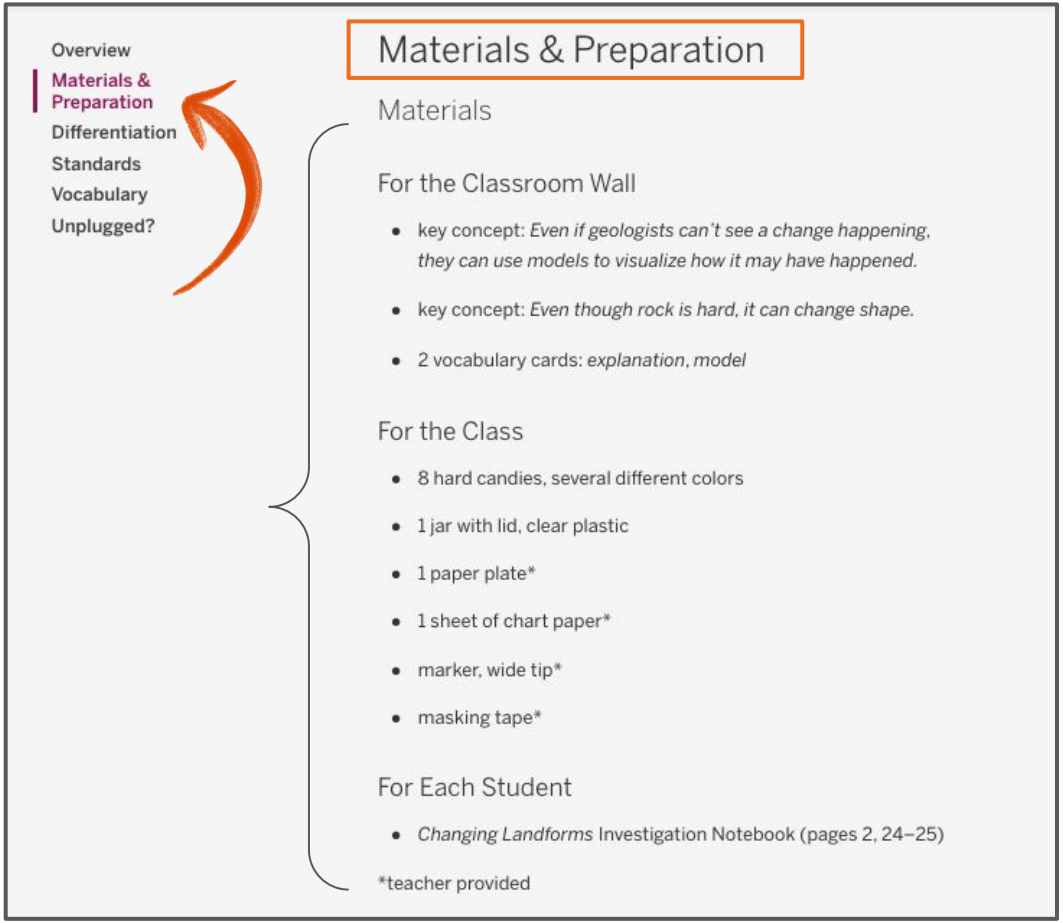
Monday	Tuesday	Wednesday	Thursday	Friday

http://bit.ly/3Xx4S18

Planning Lesson 1.6

Lesson Brief

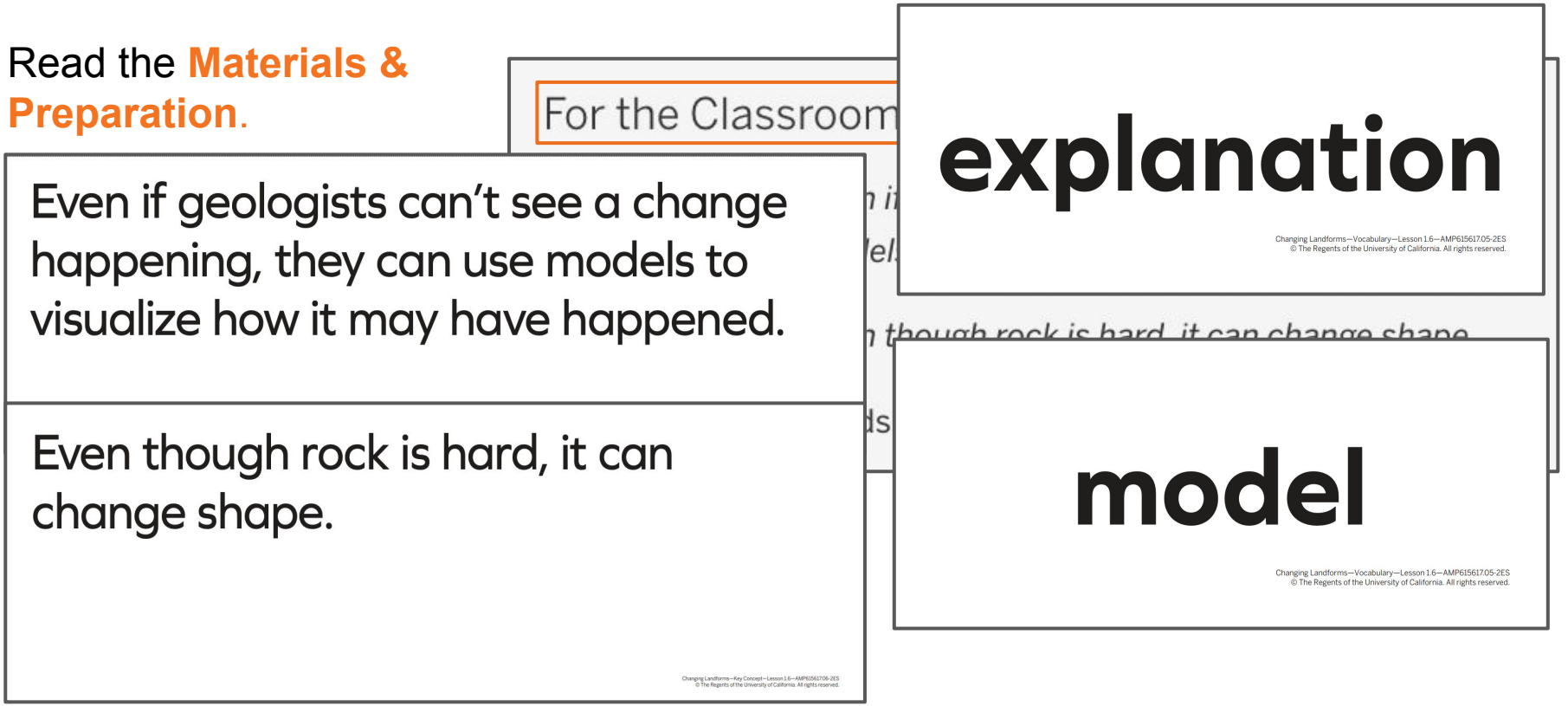
Step 3: Read the **Materials and Preparation** Document



Planning Lesson 1.6

Lesson Brief

Read the **Materials & Preparation**.



Planning Lesson 1.6

Lesson Brief

Read the **Materials & Preparation**.

Teacher Provided*

For the Class

- 8 hard candies, several different colors
- 1 jar with lid, clear plastic
- 1 paper plate*
- 1 sheet of chart paper*
- marker, wide tip*
- masking tape*

For Each Student

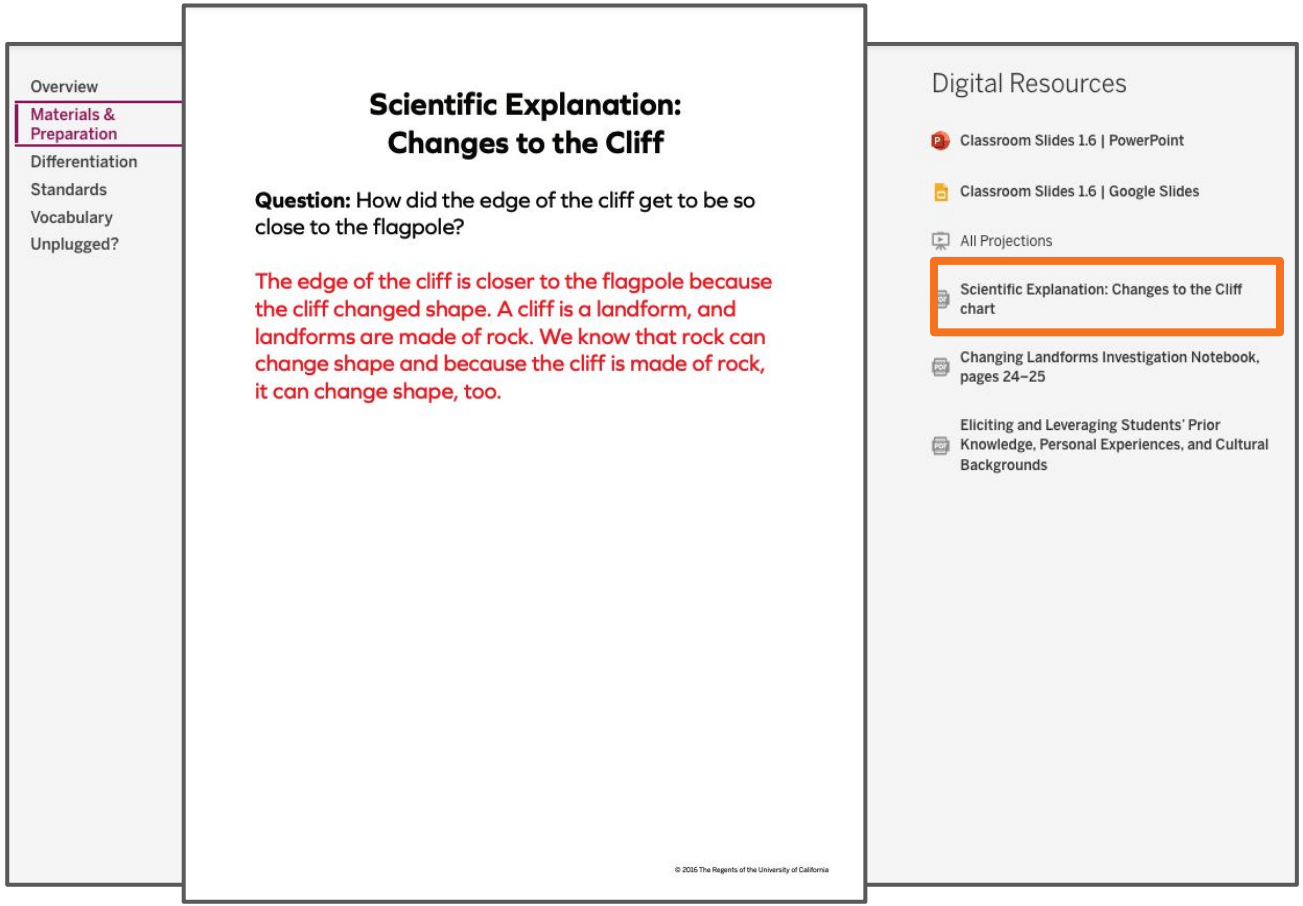
- *Changing Landforms* Investigation Notebook (pages 2, 24–25)

*teacher provided

Planning Lesson 1.6

Lesson Brief

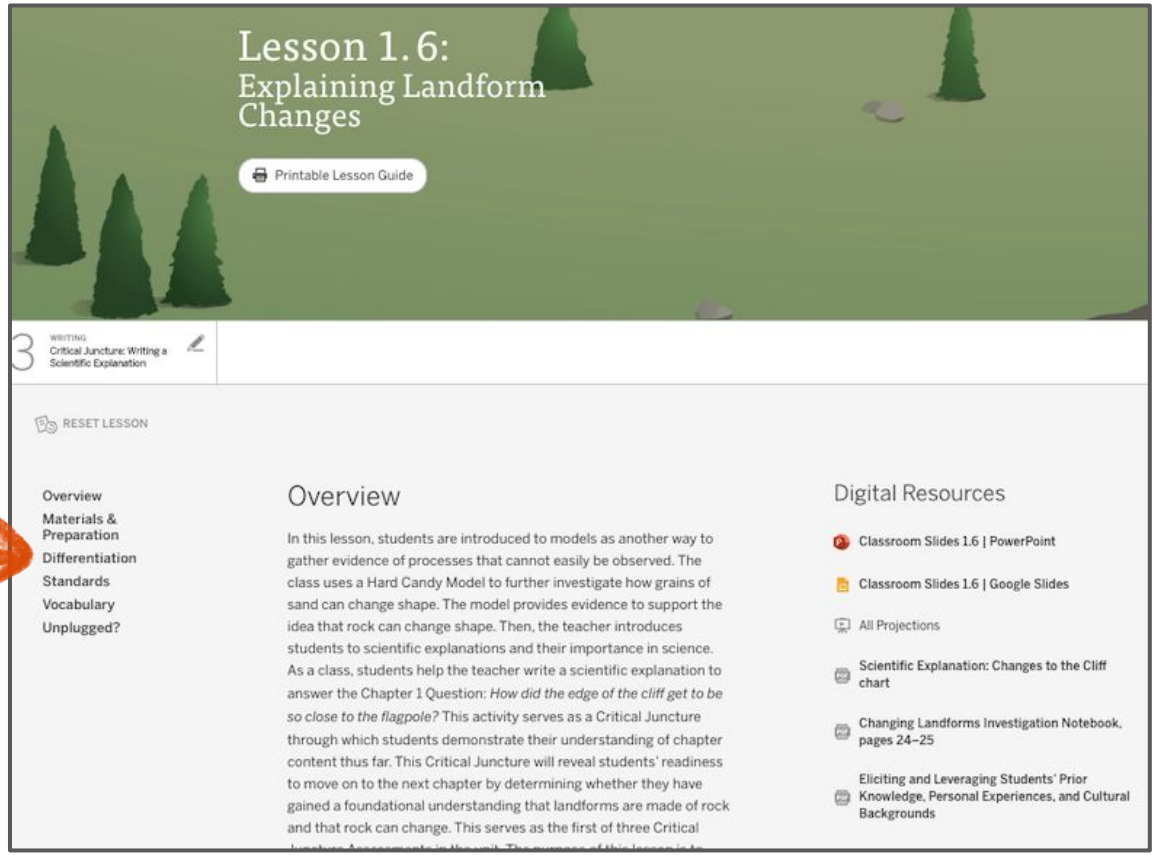
Read the **Materials & Preparation**.



Planning Lesson 1.6

Lesson Brief

Step 3: Read the **Differentiation** document

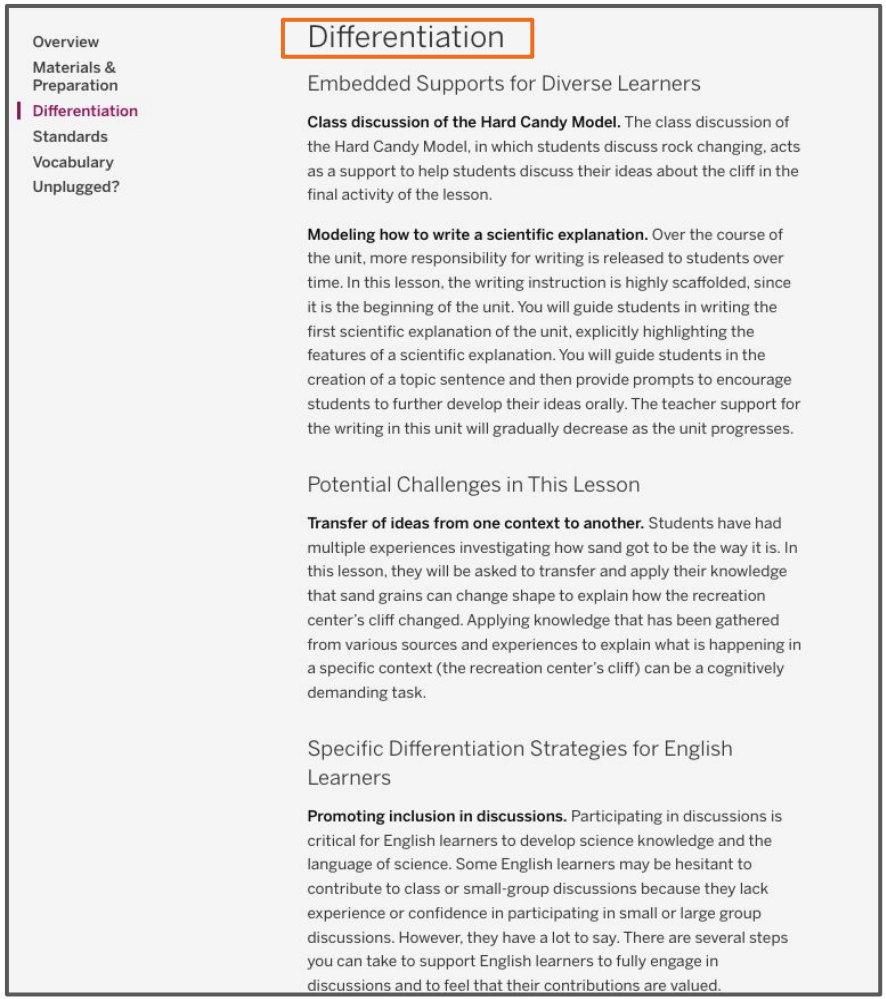


Planning Lesson 1.6

Lesson Brief

Read the **Differentiation**

- Embedded Supports for Diverse Learners
- Potential Challenges in This Lesson
- English Learners
- Students Who Need More Support
- Students Who Need More Challenge



Overview
Materials & Preparation
Differentiation
Standards
Vocabulary
Unplugged?

Differentiation

Embedded Supports for Diverse Learners

Class discussion of the Hard Candy Model. The class discussion of the Hard Candy Model, in which students discuss rock changing, acts as a support to help students discuss their ideas about the cliff in the final activity of the lesson.

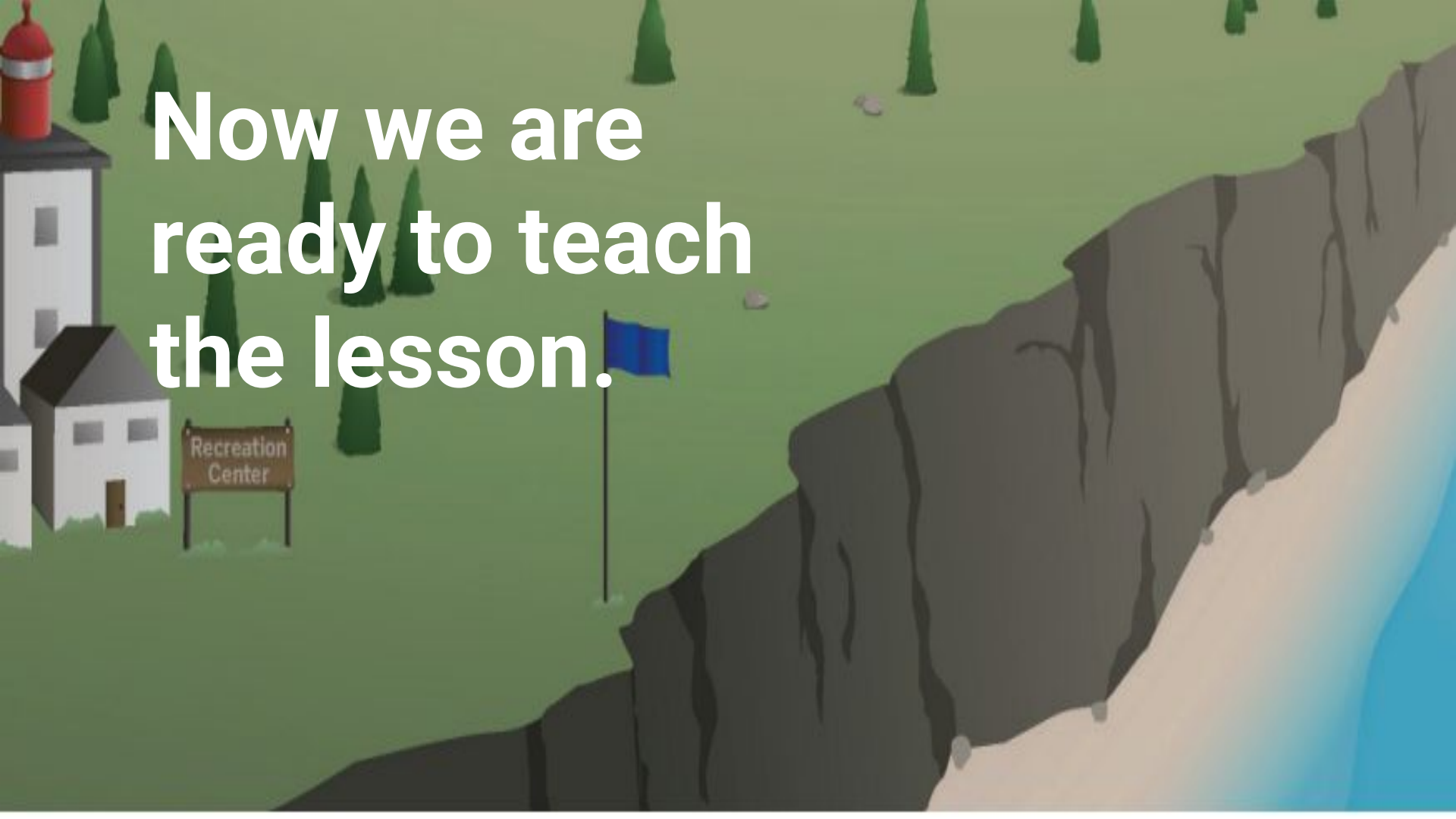
Modeling how to write a scientific explanation. Over the course of the unit, more responsibility for writing is released to students over time. In this lesson, the writing instruction is highly scaffolded, since it is the beginning of the unit. You will guide students in writing the first scientific explanation of the unit, explicitly highlighting the features of a scientific explanation. You will guide students in the creation of a topic sentence and then provide prompts to encourage students to further develop their ideas orally. The teacher support for the writing in this unit will gradually decrease as the unit progresses.

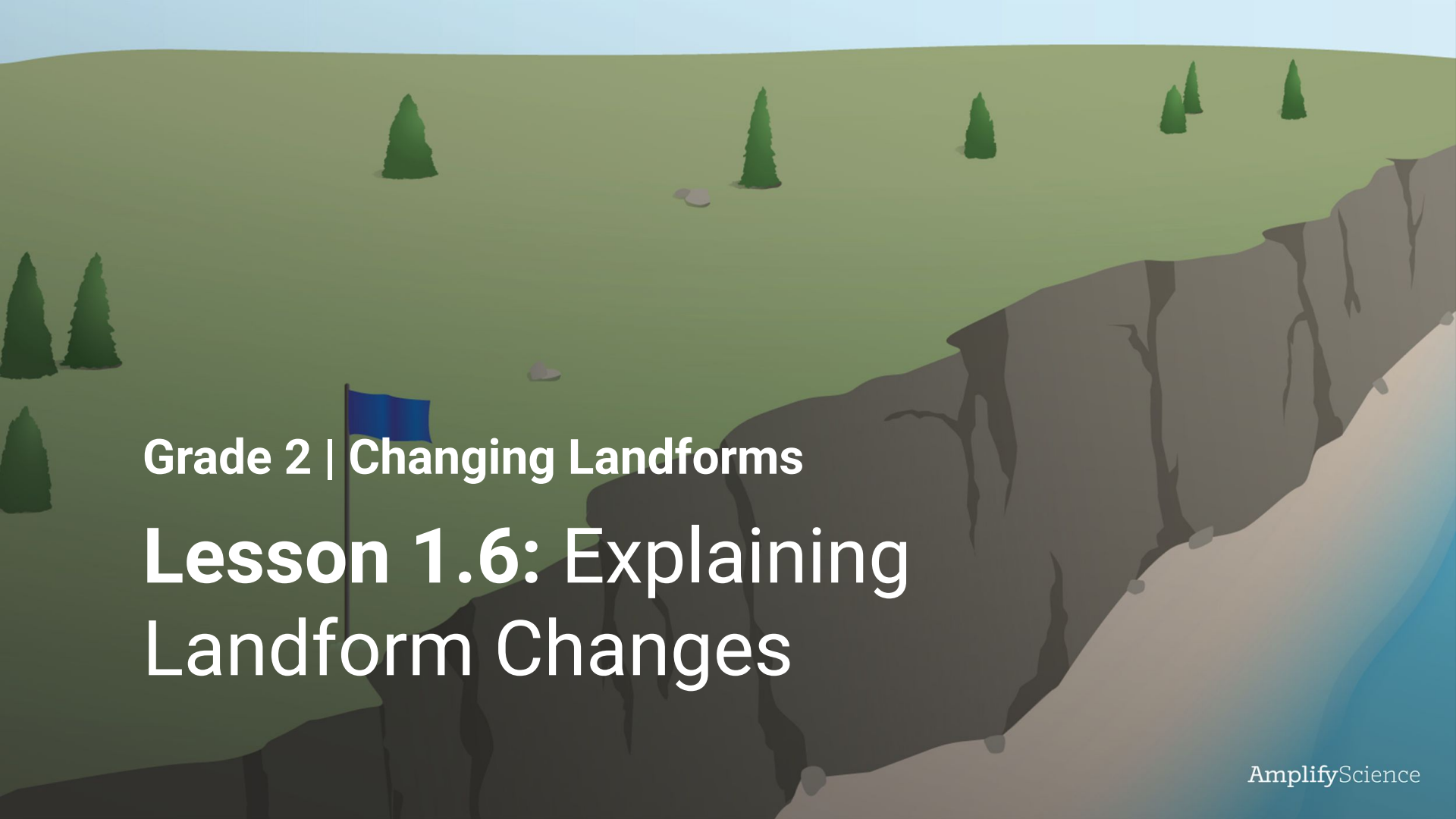
Potential Challenges in This Lesson

Transfer of ideas from one context to another. Students have had multiple experiences investigating how sand got to be the way it is. In this lesson, they will be asked to transfer and apply their knowledge that sand grains can change shape to explain how the recreation center's cliff changed. Applying knowledge that has been gathered from various sources and experiences to explain what is happening in a specific context (the recreation center's cliff) can be a cognitively demanding task.

Specific Differentiation Strategies for English Learners

Promoting inclusion in discussions. Participating in discussions is critical for English learners to develop science knowledge and the language of science. Some English learners may be hesitant to contribute to class or small-group discussions because they lack experience or confidence in participating in small or large group discussions. However, they have a lot to say. There are several steps you can take to support English learners to fully engage in discussions and to feel that their contributions are valued.


Now we are ready to teach the lesson.
Recreation Center



Grade 2 | Changing Landforms

Lesson 1.6: Explaining Landform Changes

AmplifyScience

20 MIN

Activity 1

Gathering Evidence from a Hard Candy Model

Remember that we are investigating this question:

How do geologists figure out how something changed when they can't observe it changing?

When we investigated **sand samples,** how did we figure out how the sand got to be the way it is?

When we investigated sand samples, we figure out that _____.

We've been making **observations** to help us **visualize** how sand got to be the way it is.

Scientists also use **models** to help them investigate things they cannot observe.

A model is something scientists make to answer questions about the real world.

Vocabulary

model

something scientists make to answer questions about the real world

These candies represent grains of sand.

We learned that sand can change **shape.** We'll use this **model** to gather **evidence** about sand changing shape.

We'll take turns shaking the jar to represent waves and sand crashing.

Visualize what will happen to the **shape** of the hard candies when we shake the jar.

Hard Candy Model

Step 1
Shake the jar hard, ten times.

Step 2
Pass it to the next person.

Step 3
We'll keep going until everyone has had a chance to shake the jar.

What do you **observe** about the hard candies after they've been shaken up?

I observe that the hard candies are _____.

If the **hard candies** in our **model** represent **sand grains**, what evidence does the model give us to support the idea that sand grains can change shape?

The evidence the model gives us is _____.

The evidence that the model gives us to support the idea of the sand grains is _____.

How is this model **similar** to the real world?

How is it **different?**

The model is similar because _____.

The model is different because _____.

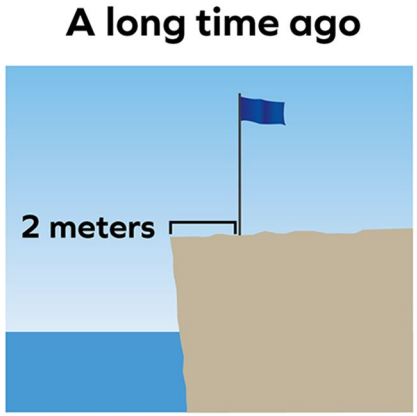
Key Concept

Even if geologists can’t see a change happening, they can use models to visualize how it may have happened.

10 MIN

Activity 2

Considering the Cliff



Remember, the question we are trying to answer:

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

We're investigating sand to help explain what happened to the cliff.

What **evidence** did we gather about sand that might help us **explain** why the cliff looks the way it does now?

The evidence that we gathered about the sand is _____.

_____ helps us explain why the cliff looks the way it does now.

Let's return to the Hard Candy Model to visualize rock changing.

If I continue to shake the jar, what will happen to the hard candies?

If I continue to shake the jar, the hard candies will _____.

We can use the Hard Candy Model to **visualize** something we cannot **observe:** rock changing.

The model helps us visualize rock breaking and changing shape. It provides us with additional **evidence** that **rock can change shape.**

Key Concept

Even though rock is hard, it can change shape.

30 MIN

Activity 3

Critical Juncture: Writing a Scientific Explanation

Scientists often write **explanations** about how things work or why things happen.

They write explanations for other scientists and for people who are not scientists, like Director Higgins. In this way, many people can learn from scientists' investigations and thinking.

Vocabulary

explanation

a description of how something works
or why something happens

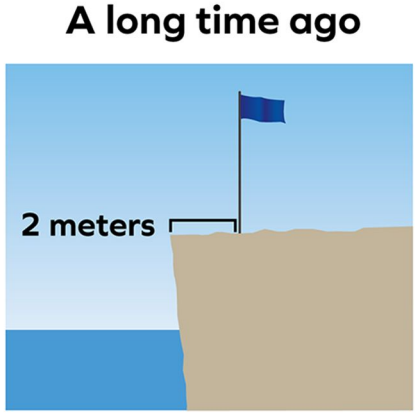
What Is a Scientific Explanation?

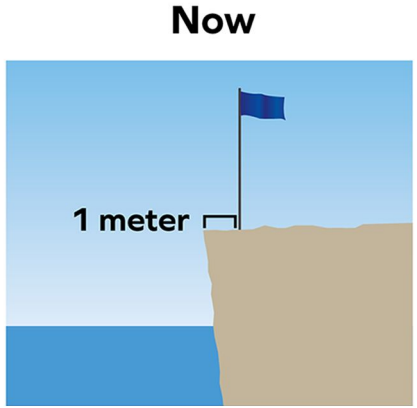
1. It answers a question.
2. It is based on science ideas you have learned.
3. It is shared with someone.

Scientific Explanation: Changes to the Cliff

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

Together, we will **write a scientific explanation** to answer the question on this chart.





How do you think the edge of the cliff got to be so close to the flagpole?

Scientific Explanation: Changes to the Cliff

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

Let's begin **writing our explanation,** based on our discussions.

When scientists write explanations to answer their questions, they **support** their answers with **ideas** they learned while **reading** and **investigating.** We can support our first sentence with other ideas.

Let's start by discussing this question.

What do we know about the cliff?

We know that _____.

Scientific Explanation: Changes to the Cliff

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

Let’s add another sentence to our **explanation,** based on what we just talked about.

Scientific Explanation: Changes to the Cliff

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

Is there more information we can include to **support** our first sentence? What do we know about **rock** that could help us explain?

We know that rock _____.

Scientific Explanation: Changes to the Cliff

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

Let’s add one more **supporting sentence** to our explanation.

Then, we can read the whole thing out loud.

End of Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Amplify.

Published and Distributed by Amplify. www.amplify.com

Plan for the day

- Introduction and framing
- Writing in Amplify Science
  - Writing as part of a multimodal experience
  - Supporting students with writing
  - Writing a culminating explanation or argument
  - Additional supports
- Model Lesson
- **Planning**
- Closing

Planning for activities

Personalize Classroom Slides

What slides do not need to be visible to students? How will these reflect the timing decision you made? Additions? Personalized language?

Digital Tools

How will students navigate? What might be challenging? What is the key take-away? Do you need to “check-out” devices? Review “Apps in this Unit.”

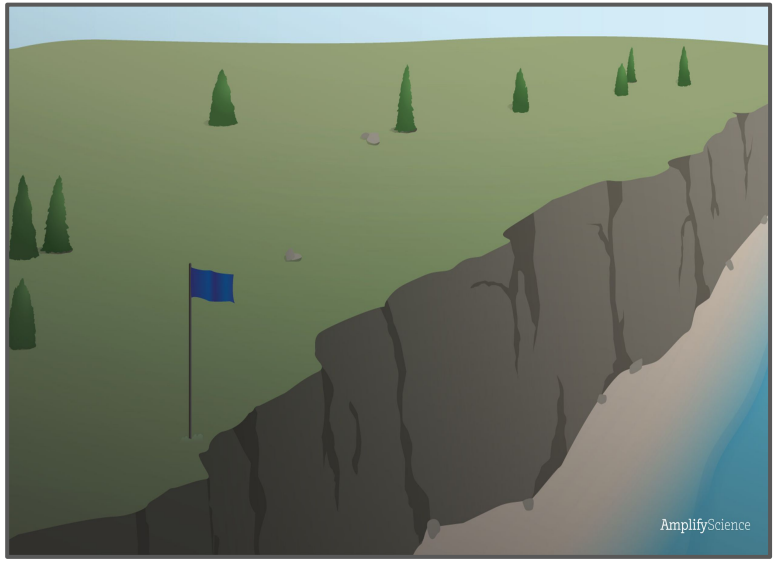
Hands-on materials

What will you need from the kit? How many will you use? What needs to be set-up in advance? Right before? After?

Work time: Planning

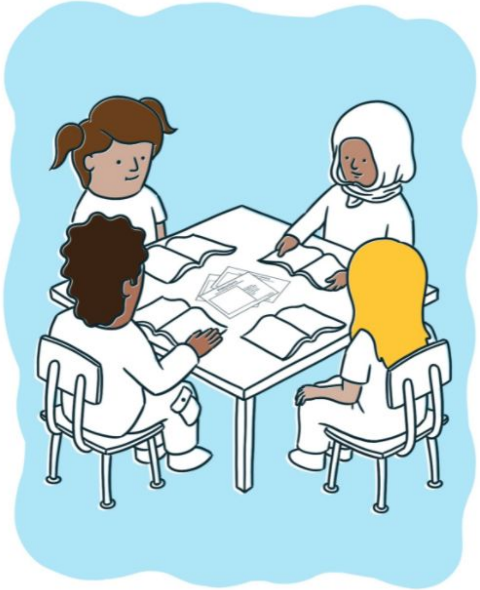
Navigate to a lesson that you'll be teaching in the upcoming weeks

- **Identify the small writes in the lesson**
  - Analyze their purpose
  - What writing supports are embedded in the activity ?
  - Are there any additional supports you might provide?
- **Download the End-of-Unit Assessment**
  - What does each rubric assess?
  - How could the End-of-Unit help you unit planning and instruction throughout the whole unit

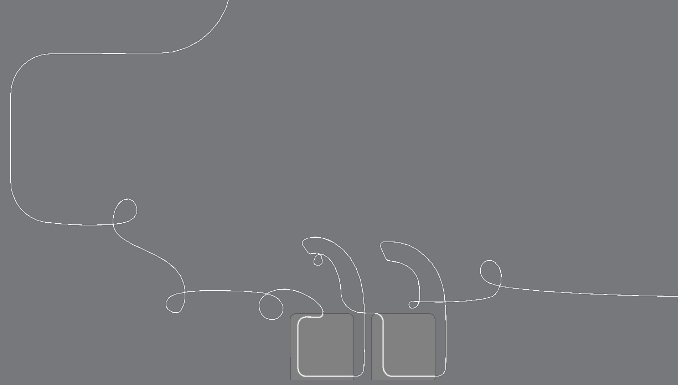


Share out

- Identify the small writes in the lesson
  - Analyze their purpose
  - What writing supports are embedded in the activity ?
  - Are there any additional supports you might provide?



Questions?



Plan for the day

- Introduction and framing
- Writing in Amplify Science
  - Writing as part of a multimodal experience
  - Supporting students with writing
  - Writing a culminating explanation or argument
  - Additional supports
- Model Lesson
- Planning
- **Closing**

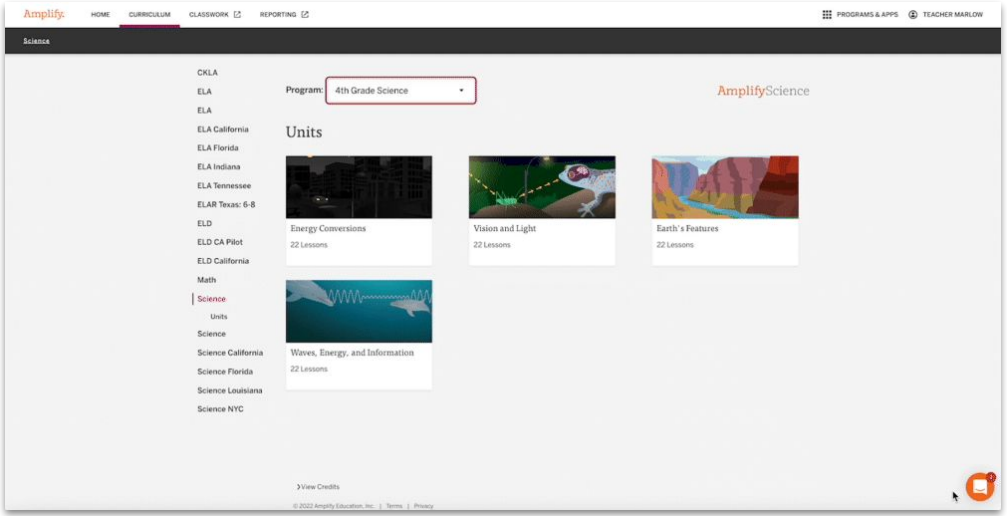
Overarching goals

- ☑ Identify specific characteristics and genres unique to science writing
- ☑ Describe how the Amplify Science writing approach supports students to engage in science practices, make sense of science ideas, and develop as writers
- ☑ Be ready to teach specific writing activities in an Amplify Science unit

Additional resources and ongoing support

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support.

Amplify Chat



Additional resources and ongoing support

Customer Care

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support, weekdays 7AM-10PM EST and weekends 10AM-6PM EST.

help@amplify.com

800-823-1969

Amplify Chat