

Amplify Science

Writing in Science

Grade 5, Unit 3: The Earth System

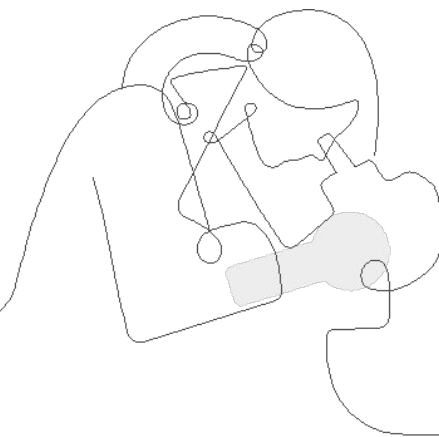
Part 3

Strengthen workshop

School/District Name

Date

Presented by Your Name



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

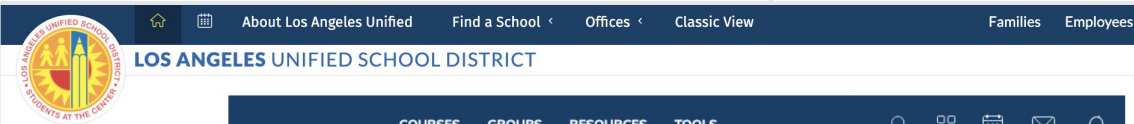
Why do scientists write?



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.

Schoolology



[← Back to Schoolology Home Page](#)

LMS App Center

The LMS App Center provides a catalog of District-approved digital content and learning tools (including digital components of adopted textbooks) that are available for classroom teachers and students to access within the learning management system, Schoolology.

For information on District-approval policies and procedures, please visit: [udipp.lausd.net](#).

- To search the full list of digital learning tools, click "Submit".
- To search by Publisher Name or Textbook Title, type in a word associated to your adopted publisher, then click "Submit".
- To narrow your search with filters such as Content Area, Grade Level, or Content Type, select from the dropdown menu, then click "Submit".

To learn more about using the LMS App Center, please refer to the following [video overview](#).

Publisher Name Starts With

Content Area All

Grade Level All

Content Type All

Textbook Title Starts With

Submit

All Amplify Products



LMS App Center

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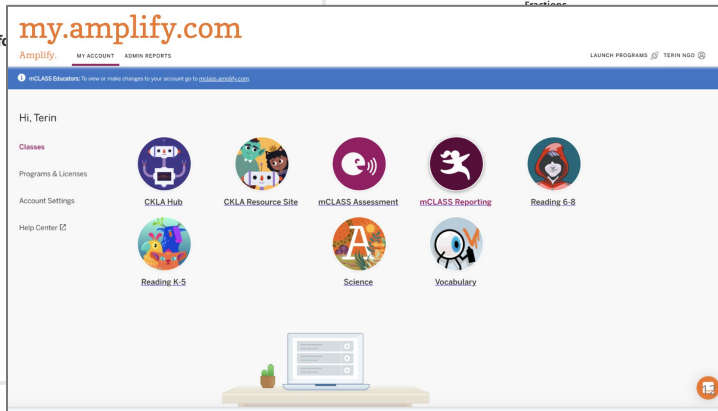
To learn more about using the LMS App Center, please refer to the following [video overview](#).

[← Search Again](#)

Amplify

Content Area: ELA
Grade Level: ES
Content Type: Supplemental
Integration Type: App (Left Navigation)
Purchase Type: District and School
Getting Started Guide
Other Info: School licenses required
mCLASS
CKLA
Amplify Reading
Amplify Science
Creative

Vendor Support Desk:
P: 800.823.9969
E: help@amplify.com
S: amplify.com/support/
Textbook Title(s):
NA



Vendor Support Desk:
P: 800.823.9969
E: help@amplify.com
S: amplify.com/support/
Textbook Title(s):
NA

op is for
only)

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.

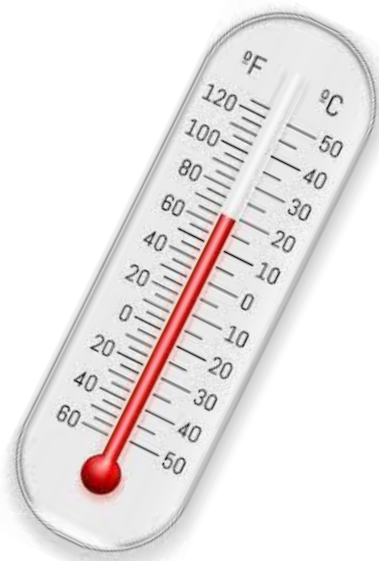
1 = Extremely Uncomfortable

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

**Let's connect
this goal to
our students**



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

What are your goals
for student outcomes?



Participant Notebook

<https://bit.ly/3JliYhU>

Reflection

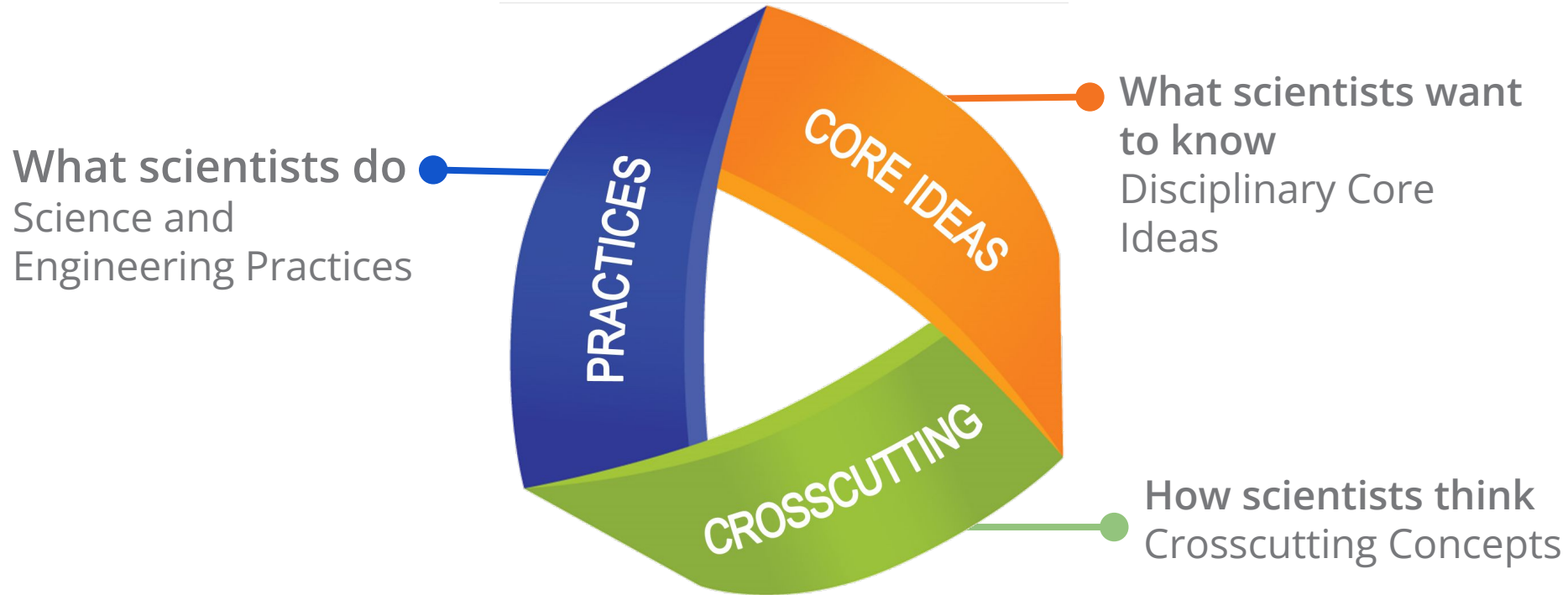
Use the provided spaces as a place for reflection throughout the session.

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.

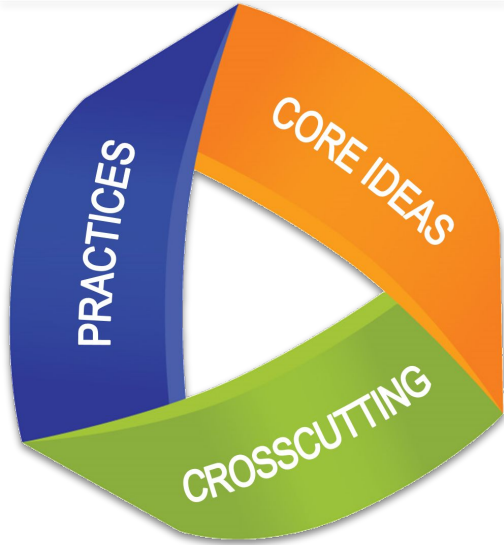
Figuring out phenomena

Using 3-D teaching and learning



Next Generation Science Standards

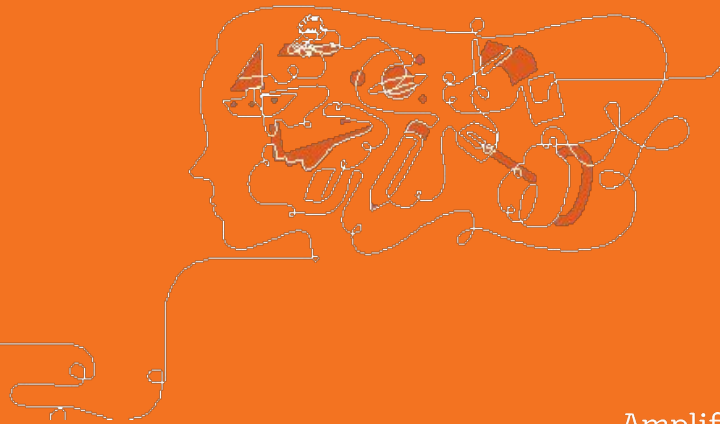
Science and Engineering Practices



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

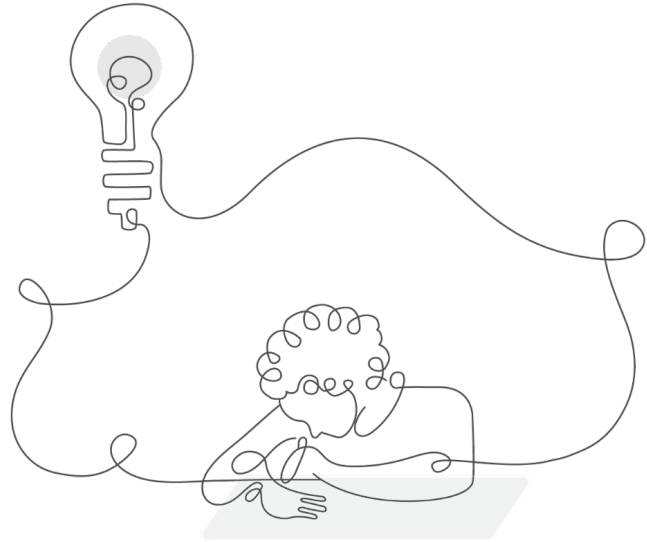
Writing in Amplify Science

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

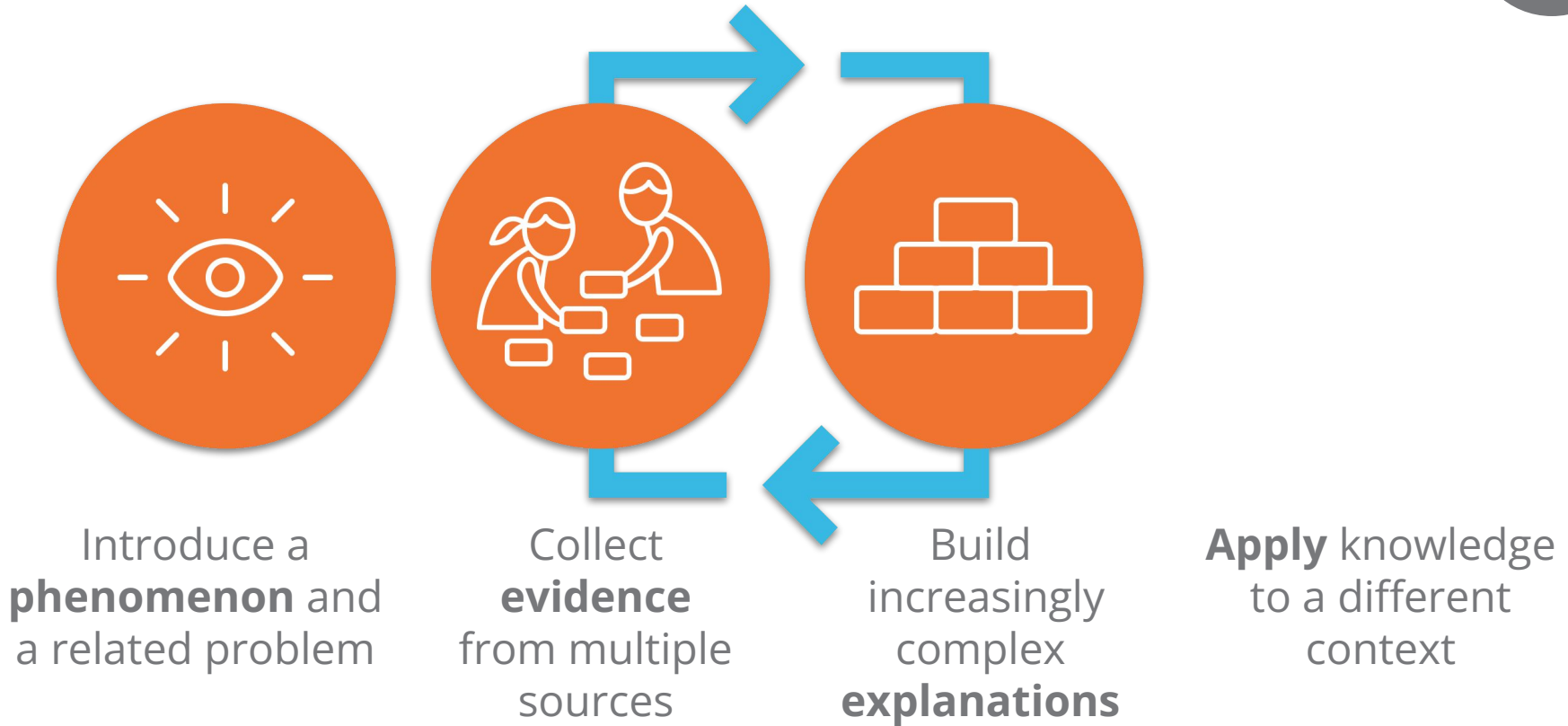


Why do students write in Amplify Science?

- 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



Phenomena-based Instruction

Inquire like a scientist.

Think like a scientist.

Quantify like a scientist.

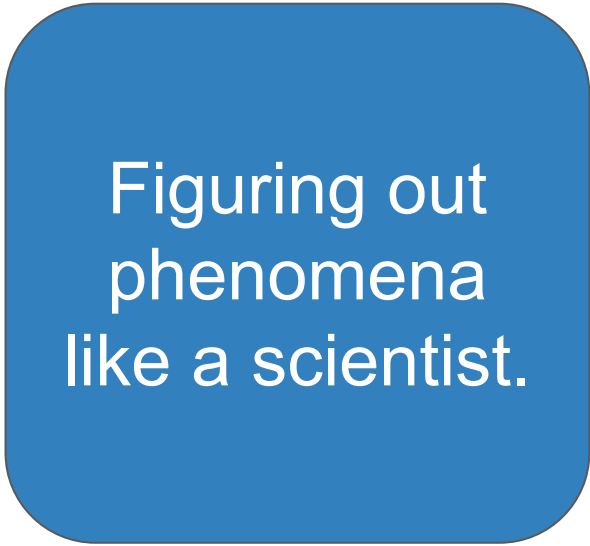
Read like a scientist.

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



The header features a stylized illustration of a forest with green trees and brown ground. Three snails are depicted: one on the left, one in the center, and one on the right. The title 'Plan for the day' is written in white text on the left side of the header.

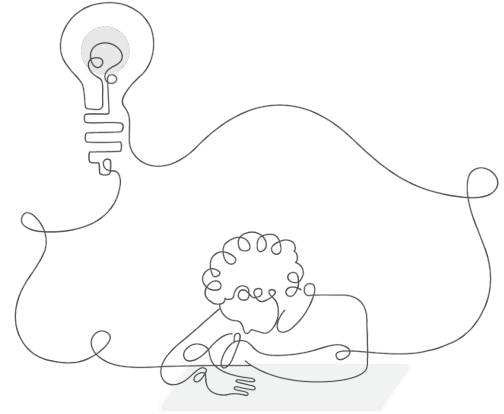
Plan for the day

- 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.



The Earth System



Problem: What is causing the water shortage in East Ferris and not in West Ferris located on the other side of the island

Role: Water Resource Engineers



We are beginning a unit about **water**.

On Ferris Island, the city of **East Ferris does not have enough water**. They need our help to solve this problem.



For this unit, we will take on the role of **water resource engineers** helping East Ferris with their water problem.



To: Water Resource Engineers

From: Mayor McKnight, East Ferris City Hall

Subject: Water Shortage in East Ferris

I am worried about the availability of water in East Ferris. The people in this city depend on water for many things, and we are now beginning to have a water shortage. I think this is a big problem, but many of the people in East Ferris do not seem concerned. I know that West Ferris is not having a water shortage, but they get a lot of rain on their side of the island. Though East Ferris has never gotten much rain, we have only just begun to have problems with the availability of water. I need your help to explain to the people of East Ferris why our city is running out of water but West Ferris is not.



Unit Question

What can determine how much water is available for human use?



Chapter 1 Question

Why is East Ferris running out of water while West Ferris is not?



The Earth System

Coherent Storylines



How can East Ferris turn wastewater into clean freshwater?



Why is there more water vapor high up over West Ferris than East Ferris?



Why is more water vapor getting cold over West Ferris than East Ferris?



Why does more rain form over West Ferris than East Ferris?



Why is East Ferris running out of water while West Ferris is not?

Sample instructional sequence

Grade 5 The Earth System

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 5 The Earth System

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?



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

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1

in your unit

is upcoming. Review the activity and 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?

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The Earth System: Writing in Chapter 1

Chapters

Chapter 1: Why is East Ferris running out of water while West Ferris is not? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Water Shortages, Water
Solutions



LESSON 1.3
Explaining the East Ferris
Water Shortage

Small write 1: Investigating and recording data (1.1)



Water and Land on Earth

Water	Land

Places Where Water Is Found on Earth

- ocean
- rivers
- groundwater
- lakes
- glaciers
- wetlands

Activity 3

Water and Land on Earth



Today, we are going to investigate this question:

Where is water on Earth?



Let's use this globe to think about **where** water is on Earth and **how much** water there is.



We will toss the globe to one another and tally where **each** of our thumbs land—on water or land.

Water and Land on Earth

Water	Land

I will record our tally on this chart.



Do you think water or land will get **more tally marks?**

Why do you think so?

Water and Land on Earth



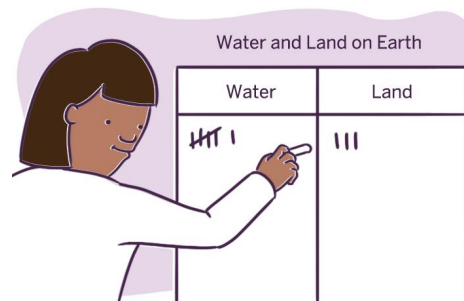
Step 1

We will toss the globe to one another.



Step 2

When you catch the globe, announce where **each** of your thumbs landed—on **water or land**.



Step 3

On the board, we will record a tally of how many times thumbs end up on water and how many times they end up on land.

Water and Land on Earth

Water	Land

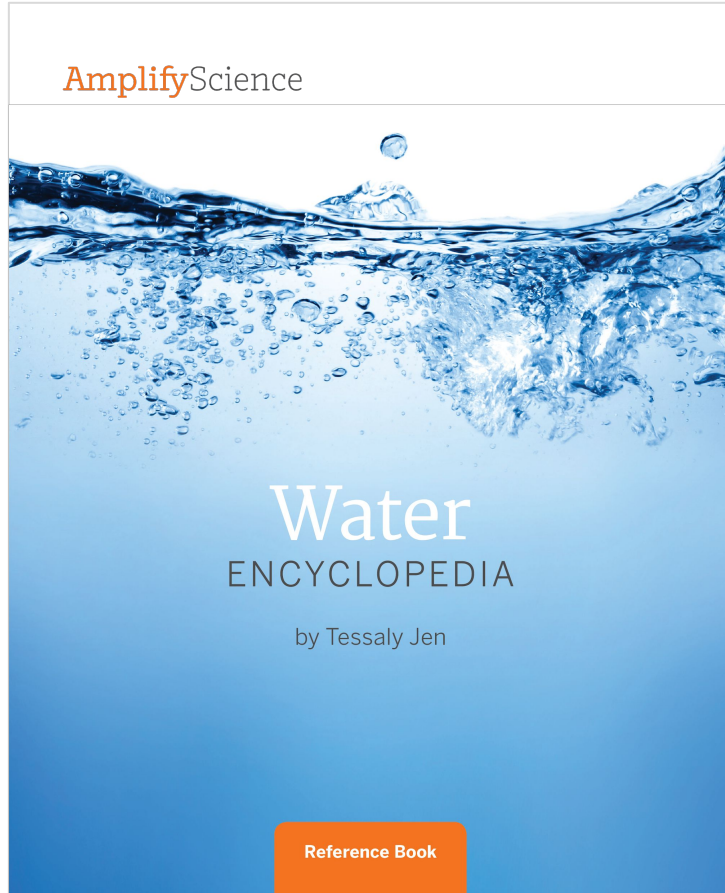


What do you notice about how many **tally marks** are in each category?

Activity 4

Water Distribution on Earth





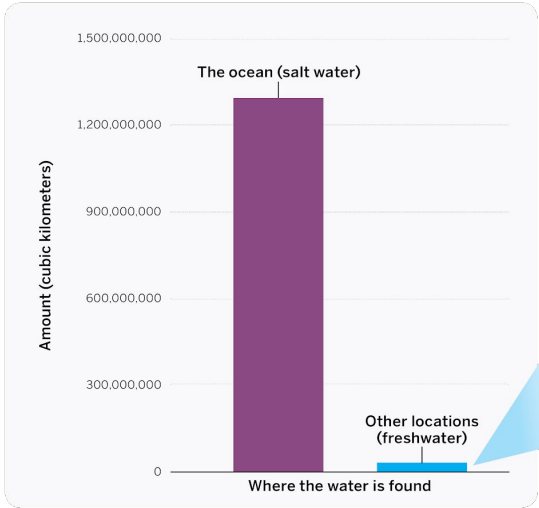
Look through the book to see how it is organized and what kind of information it contains.

What do you **notice**?

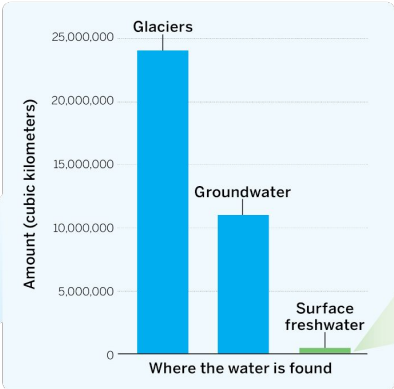


Read pages 30–31. What do you notice?

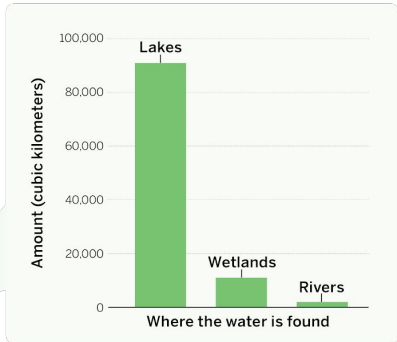
Water on Earth



Freshwater on Earth



Surface Freshwater on Earth



Small write 2: Collecting and interpreting information (1.1)

Places Where Water Is Found on Earth

- ocean
- rivers
- groundwater
- lakes
- glaciers
- wetlands

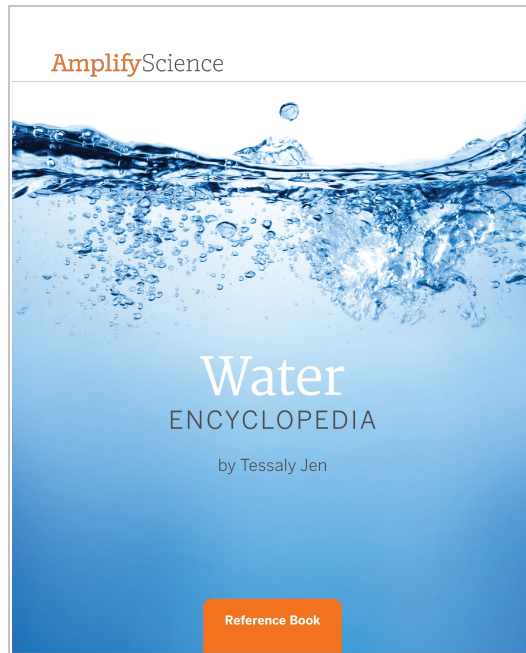
Use the graphs in *Water Encyclopedia* to help you answer this question.

How would you order
these places from the
**least amount of water to
the most?**

Reflecting on small write 1 & 2

Collecting and interpreting data is a small writing opportunity.

What are your ideas about the **purpose and role of writing** in this small write activity?



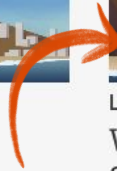
The Earth System: Writing in Chapter 1

Chapters

Chapter 1: Why is East Ferris running out of water while West Ferris is not? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Water Shortages, Water
Solutions

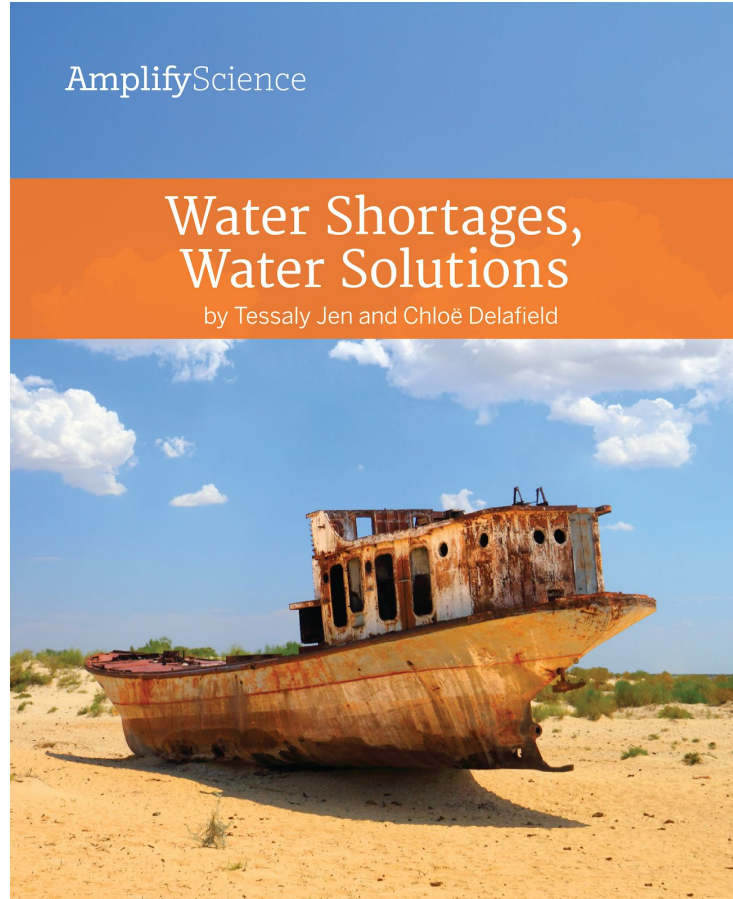


LESSON 1.3
Explaining the East Ferris
Water Shortage

Activity 2

Introducing Synthesizing





We will read this book about **what causes water shortages** around the world and some of the **ways people deal with water shortages.**

Small write 3: Synthesizing Ideas About Water Shortages (1.2)

Name: _____ Date: _____

Synthesizing Ideas About Water Shortages

1. Read the question below.
2. Recall big ideas from *Water Encyclopedia* that help you answer the question, and record them in the first box.
3. Read pages 4–7 of *Water Shortages*, *Water Solutions* and record big ideas that help you answer the question in the second box.
4. Connect ideas together to come up with a new understanding that answers the question.
5. Record your new understanding in the box below the arrow.

Question: How can people affect how much freshwater is available?

Source: *Water Encyclopedia*

Ideas:

Source: *Water Shortages*, *Water Solutions*

Ideas:



New understanding:

We will use the boxes on this page to record ideas from *Water Encyclopedia* and *Water Shortages*, *Water Solutions*.

Name: _____ Date: _____

Synthesizing Ideas About Water Shortages

1. Read the question below.
2. Recall big ideas from *Water Encyclopedia* that help you answer the question, and record them in the first box.
3. Read pages 4–7 of *Water Shortages, Water Solutions* and record big ideas that help you answer the question in the second box.
4. Connect ideas together to answer the question.
5. Record your new understanding in the third box.

Question: How can people reduce water use?

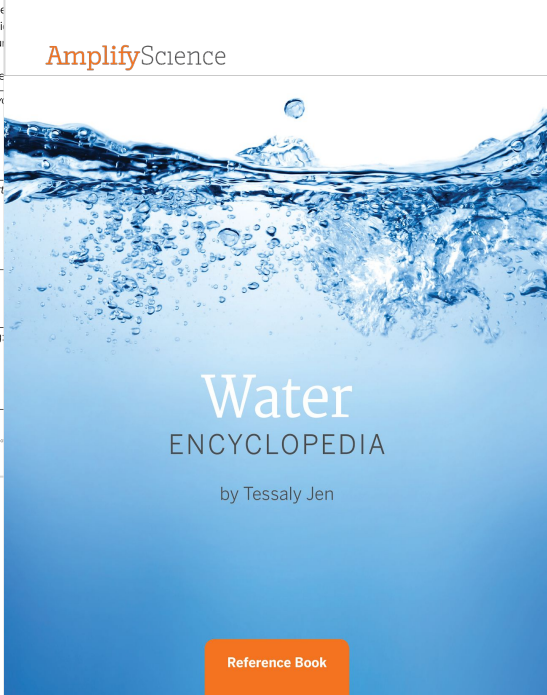
Source: *Water Encyclopedia*

Ideas:

Source: *Water Shortages, Water Solutions*

Ideas:

New understanding:



The image shows the front cover of the 'Water Encyclopedia' reference book. The cover has a blue background with a photograph of water splashing. The title 'Water' is in large white letters, with 'ENCYCLOPEDIA' in smaller white letters below it. Below the title, it says 'by Tessaly Jen'. At the bottom, there is an orange button that says 'Reference Book'. The AmplifyScience logo is visible in the top left corner of the cover.

We're going to record big ideas, not small details.



What was one **big idea** that we learned from the graphs we examined in *Water Encyclopedia*?

Overuse, pollution, and **drought** are three major causes of water shortages. Each of these issues is more common in some places than others, but most parts of the world are affected by water shortages. This book is about water shortages in the United States and around the world, and some **solutions** to water problems.



This river is polluted and the water is not safe for people to use. Pollution like this contributes to water shortages.

I think this first sentence is a **big idea** since it is what the book is going to be about. It also relates to our question of how people can affect how much water is available.

Name: _____ Date: _____

Synthesizing Ideas About Water Shortages

1. Read the question below.
2. Recall big ideas from *Water Encyclopedia* that help you answer the question, and record them in the first box.
3. Read pages 4–7 of *Water Shortages*, *Water Solutions* and record big ideas that help you answer the question in the second box.
4. Connect ideas together to come up with a new understanding that answers the question.
5. Record your new understanding in the box below the arrow.

Question: How can people affect how much freshwater is available?

Source: *Water Encyclopedia*

Ideas:

Most of Earth's water is salt water, so there is not a lot of freshwater on Earth.Source: *Water Shortages*, *Water Solutions*

Ideas:

Overuse, pollution, and drought are three major causes of water shortages.

New understanding:



Record this big idea in your notebooks.

Name: _____ Date: _____

Synthesizing Ideas About Water Shortages

1. Read the question below.
2. Recall big ideas from *Water Encyclopedia* that help you answer the question, and record them in the first box.
3. Read pages 4–7 of *Water Shortages, Water Solutions* and record big ideas that help you answer the question in the second box.
4. Connect ideas together to come up with a new understanding that answers the question.
5. Record your new understanding in the box below the arrow.

Question: How can people affect how much freshwater is available?

Source: *Water Encyclopedia*

Ideas:

Source: *Water Shortages, Water Solutions*

Ideas:



New understanding:



Based on what you learned from the two books, what **new understandings** do you have about the answer to our question?

Name: _____ Date: _____

Synthesizing Ideas About Water Shortages

1. Read the question below.
2. Recall big ideas from *Water Encyclopedia* that help you answer the question, and record them in the first box.
3. Read pages 4–7 of *Water Shortages, Water Solutions* and record big ideas that help you answer the question in the second box.
4. Connect ideas together to come up with a new understanding that answers the question.
5. Record your new understanding in the box below the arrow.

Question: How can people affect how much freshwater is available?

Source: *Water Encyclopedia*

Ideas:

Source: *Water Shortages, Water Solutions*

Ideas:



New understanding:



**Record a new
understanding in
your notebooks.**

The Earth System: Writing in Chapter 1

Chapters

Chapter 1: Why is East Ferris running out of water while West Ferris is not? ⓘ



LESSON 1.1
Pre-Unit Assessment



LESSON 1.2
Water Shortages, Water
Solutions



LESSON 1.3
Explaining the East Ferris
Water Shortage

Vocabulary



biosphere

all the living things on Earth

Vocabulary



hydrosphere

all of the liquid water and ice on Earth

Small write 4: Recording and Diagramming (1.3)

Parts of the Earth System

The Earth is a system. A **system** has **multiple parts** that interact with one another in different ways.

Small write 4: Recording and Diagramming (1.3)

Parts of the Earth System

biosphere

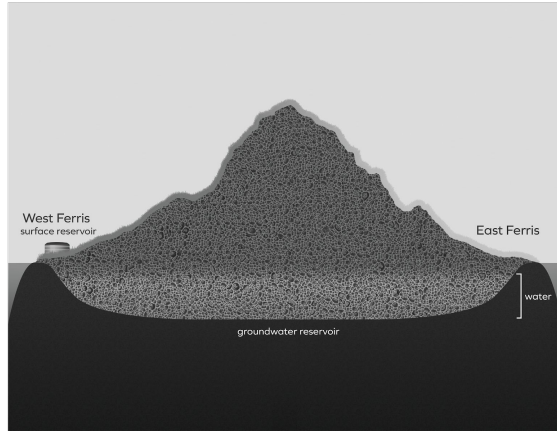
hydrosphere

Let's add **biosphere** and **hydrosphere** to our chart.

Name: _____ Date: _____

Ferris Island Diagram

1. Add drawings and labels to the diagram below to show where East Ferris and West Ferris get their water.
2. Add drawings and labels to the diagram to show why East Ferris is running out of water.



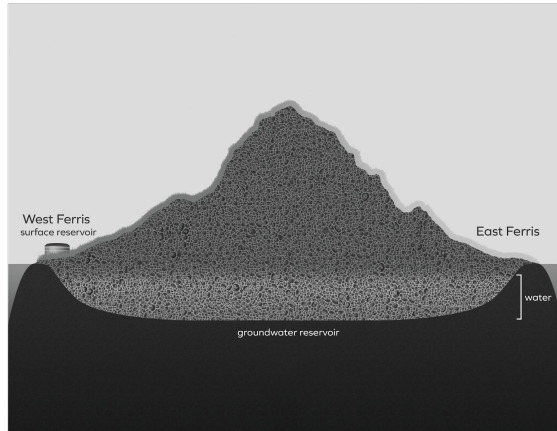
Turn to page 7 in your notebooks.

You will work in pairs to
add to this diagram to
explain why East Ferris
is running out of water.

Name: _____ Date: _____

Ferris Island Diagram

1. Add drawings and labels to the diagram below to show where East Ferris and West Ferris get their water.
2. Add drawings and labels to the diagram to show why East Ferris is running out of water.



The Earth System—Lesson 1.3

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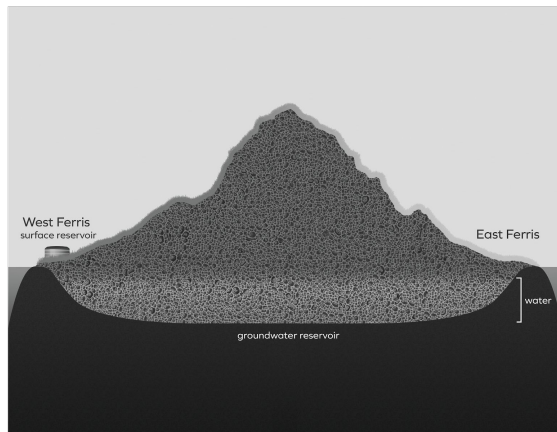


Brainstorm what to add to the diagram to show why East Ferris is running out of water.

Name: _____ Date: _____

Ferris Island Diagram

1. Add drawings and labels to the diagram below to show where East Ferris and West Ferris get their water.
2. Add drawings and labels to the diagram to show why East Ferris is running out of water.



The Earth System—Lesson 1.3

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Complete your diagram.

Small write 5: Scientific Explanation (1.3)

Scientific Explanation of the Water Shortage

1. In the box below, write scientific words that you will use in your explanation.
2. Your audience is the people of East Ferris.
3. Write an explanation that answers Question 1 on the next page.
4. Refer to your Ferris Island Diagram (on page 7 on the Investigation Notebook) to help you write your explanation.
5. After you have written your explanation for Question 1, answer Question 2 on the next page following the same steps.

Scientific language



Scientists often explain their knowledge to the public. You will write **scientific explanations** to help people in East Ferris understand why they are running out of water.

What Is a Scientific Explanation?

1. It answers a question about how or why something happens.
2. It is based on ideas you learned from investigations and text.
3. It is written for an audience.

Name: _____ Date: _____

Scientific Explanation of the Water Shortage (continued)

Question 1: Why is East Ferris running out of water?

East Ferris is running out of water because _____

Question 2: Why is West Ferris not running out of water?

West Ferris is not running out of water because _____

Your first sentence should clearly state the answer to the question.



How would you complete this sentence on page 9 in your notebooks?

Name: _____ Date: _____

Scientific Explanation of the Water Shortage (continued)

Question 1: Why is East Ferris running out of water?

East Ferris is running out of water because _____

Question 2: Why is West Ferris not running out of water?

West Ferris is not running out of water because _____



Write an explanation about East Ferris. Then, **write** an explanation that answers the question about West Ferris.

Sample Write: Writing an Explanation

Question: Why is East Ferris running out of water?

East Ferris is running out of water because they are using more water than is going into the groundwater reservoir. When people in East Ferris use water, they take it out of the groundwater reservoir. The amount of water flowing in has stayed the same, but the people of East Ferris are taking out more water than they used to. This means that there is less clean freshwater available.

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 initial explanations about rain and the distribution about rain/water.
Synthesizing ideas about water shortages.
Reflect on why it's a good idea to conserve water.
Collecting and analyzing data using diagrams.
Writing a scientific explanation about water shortage.

What were the different types of writing in Chapter 1?



Small Writes

Writing initial explanations about rain and the distribution of rain/water.

Synthesizing ideas about water shortages.

Reflect on why it's a good idea to conserve water.

Collecting and analyzing data using diagrams.

Writing a scientific explanation about water shortage.

Writing across a chapter: *The Earth System* Chapter 1

Lesson 1.1	Lesson 1.2	Lesson 1.3	Color Codes
<div>Pre-unit assessment: Explain</div> <div>Investigating and recording data</div> <div>Collecting and interpreting data</div>	<div>Getting Ready to Read</div> <div>Synthesizing Ideas of Water Shortages</div> <div>Reading Reflection: <i>Water Shortages, Water Solutions</i> and <i>Water Encyclopedia</i></div>	<div>Daily Written Reflection</div> <div>Ferris Island Diagram</div> <div>Scientific Explanation of Water Shortage</div> <div>Check your understanding</div>	<div>Record data / observations</div> <div>Activate prior knowledge and reflect on understanding</div> <div>Organize and keep track of ideas</div> <div>Explain or persuade</div> <div>Sense making</div>

Writing across a chapter: *The Earth System* Chapter 1

Lesson 1.1	Lesson 1.2	Lesson 1.3	Color Codes
<div>Pre-unit assessment: Explain</div> <div>Investigating and recording data</div> <div>Collecting and interpreting data</div>	<div>Getting Ready to Read</div> <div>Synthesizing Ideas of Water Shortages</div> <div>Reading Reflection: <i>Water Shortages, Water Solutions</i> and <i>Water Encyclopedia</i></div>	<div>Daily Written Reflection</div> <div>Ferris Island Diagram</div> <div>Scientific Explanation of Water Shortage</div> <div>Check your understanding</div>	<div>Record data / observations</div> <div>Activate prior knowledge and reflect on understanding</div> <div>Organize and keep track of ideas</div> <div>Explain or persuade</div> <div>Sense making</div>

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 2,3,4 and 5

- 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

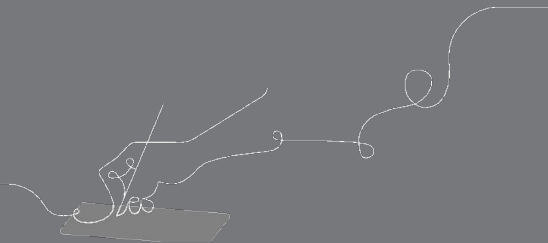


Key takeaway

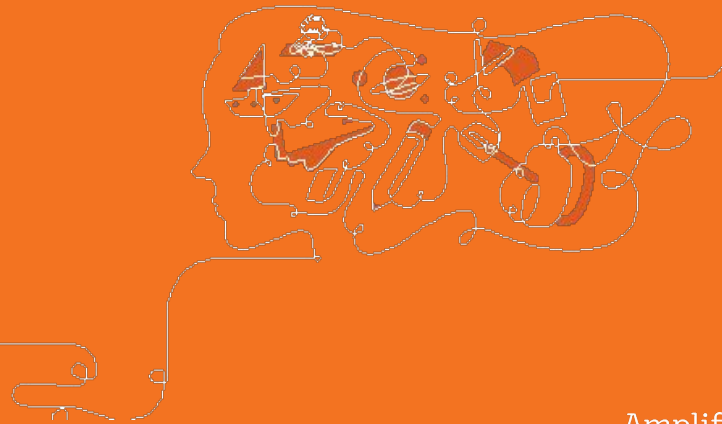
As they gather evidence, students engage in writing and discussion. They make sense of evidence they gather through small writes.

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

e



Break



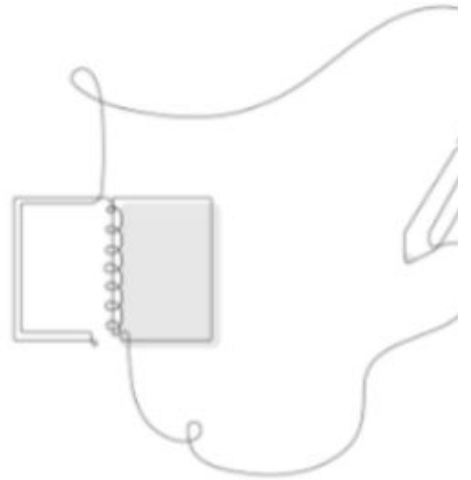
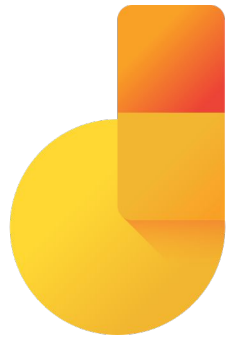
Amplify.

Plan for the day

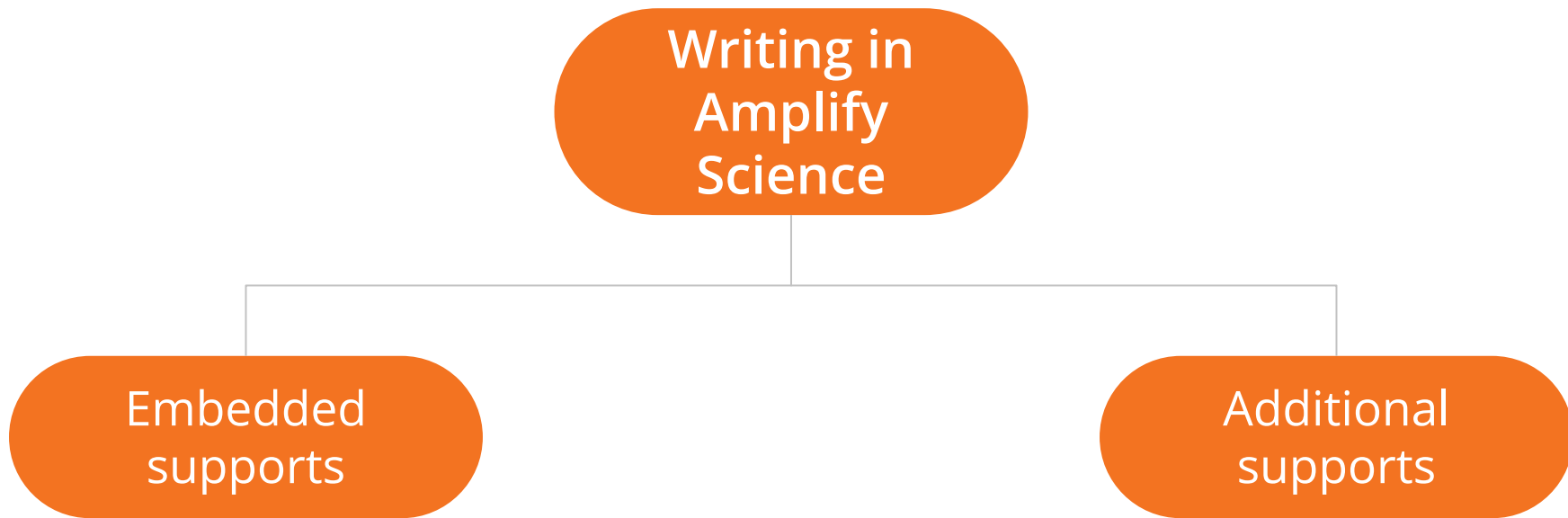


- Introduction and framing
- **Writing in Amplify Science**
 - Writing as part of a multimodal experience
 - **Supporting students with writing**
 - Writing a culminating explanation or argument
 - Additional supports
- Model Lesson
- Planning
- Closing

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



Supporting students with writing

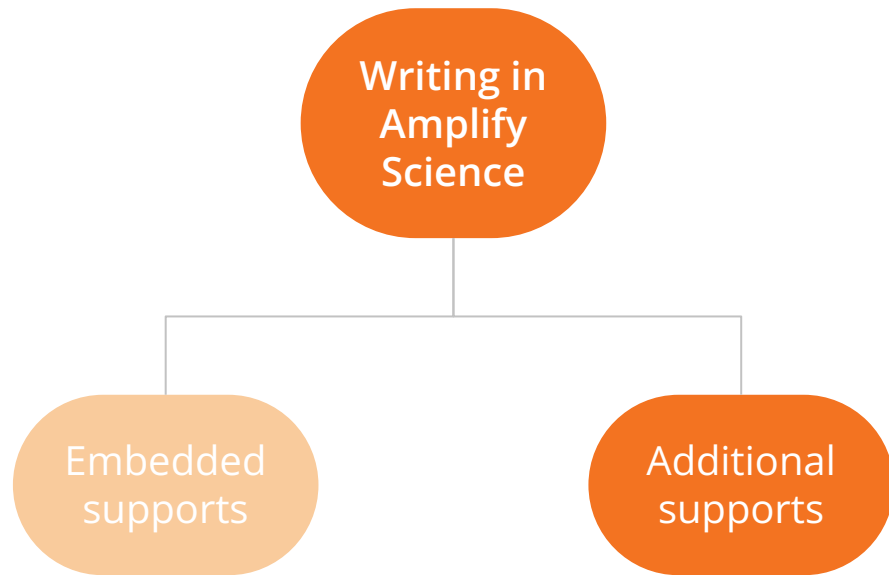


Embedded writing supports

- 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

The Earth System Progress Build

Assumed prior knowledge (preconceptions): Students are expected to have experienced rain and to have seen beaded water on a cold cup or dew on surfaces after a cold night.

Level 3

Mountains can redirect water vapor higher in the atmosphere.

Level 2

Water vapor condenses as it moves higher, to where the atmosphere is colder.

Level 1

Rain can happen when water vapor gets cold and condenses into liquid water.

Prior knowledge

Deep, causal understanding

Writing Build in *The Earth System*



Ch. 5	Review Guidelines	Writing a design argument using their knowledge and experiences from the previous chapters
Ch. 4	Review guidelines	
Ch. 3	Review guidelines	
Ch. 2	Review guidelines; introduce a fifth guideline	
Ch. 1	Introduce guidelines	Scaffolded writing of scientific explanation

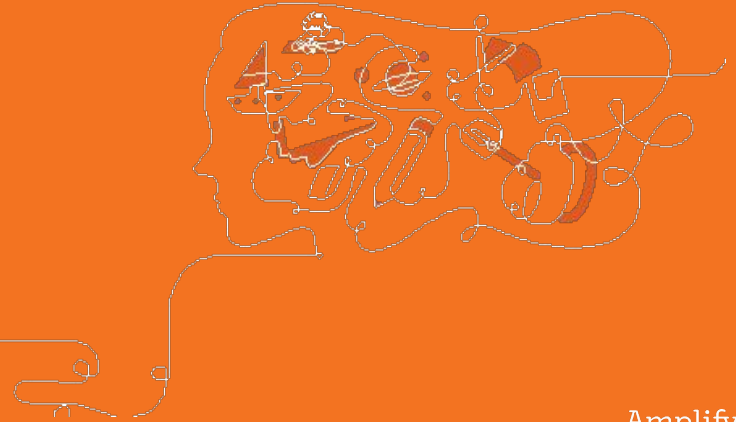
Key takeaway

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

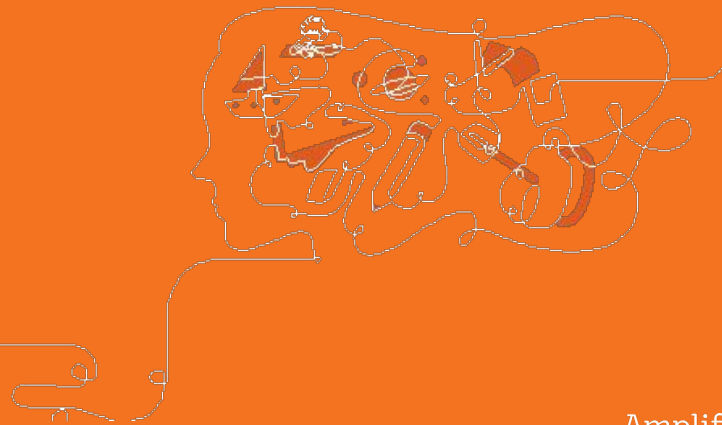
Explanation Guidelines:

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.

Argument Guidelines:

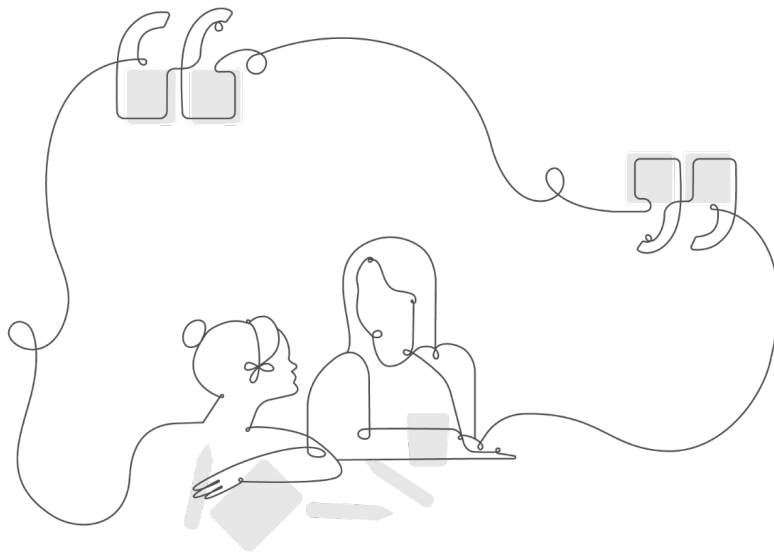
1. It answers a question with a claim about the natural world.
2. It includes evidence to support the claim. Evidence can be data and ideas.
3. It connects the evidence to the claim by linking different pieces of evidence together to show how they support the claim.
4. It uses scientific language.
5. 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

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

Do you think it is a good idea to conserve water? Why or why not?

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

6 The Earth System—Lesson 1.3 (optional)

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Daily Written Reflections

Example question:

- Do you think it is a good idea to conserve water? Why or why not?

Supplemental Investigation Notebook Pages

Name: _____ Date: _____

Reading Reflection:
Water Shortages, Water Solutions

Are there problems with water where you live? If so, what do you think is causing those problems?

What does it mean to “conserve” water?

How could you conserve more water in your everyday life?

The Earth System—Lesson 1.2 (optional)

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5

Reading Reflections

- Are there problems with water where you live?
- What does it mean to “conserve” water?
- How could you conserve more water in your everyday life?

[illegible]

Name: _____ Date: _____

End-of-Unit Writing Part 1:
Explaining the Rain Shadow on Ferris Island

1. Write an explanation that answers the question below.
2. Your audience is the people of East Ferris.
3. Make sure you include what is happening at the nanoscale as part of your explanation.
4. Your explanation should also include:
 - **a topic sentence** that answers the question.
 - supporting sentences that tell **what happens** and **why**.

Question: Why does more rain form over West Ferris than East Ferris?

More rain forms over West Ferris than East Ferris because _____

When the wind blows, _____

This is why _____

The Earth System—Lesson 4.3 (Version B)

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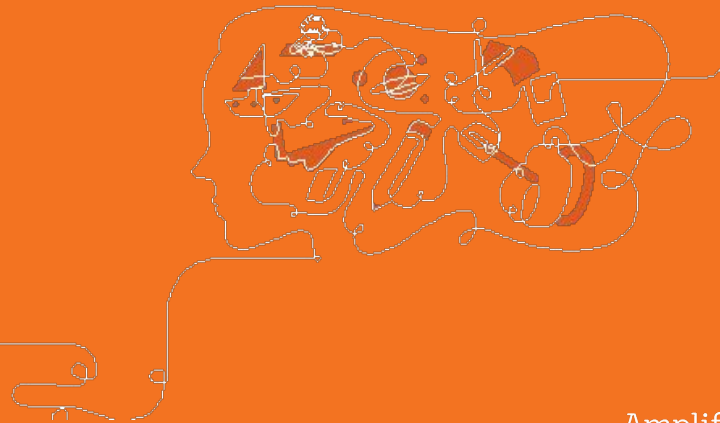
1

Version B

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



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.

The screenshot displays the Amplify website interface for Lesson 2.1: Investigating Water Drop Formation. The top navigation bar includes the Amplify logo and links for CURRICULUM, CLASSWORK, and REPORTING. The main header area features the lesson title and a 'Printable Lesson Guide' button. Below the header is a horizontal menu with four tabs: Lesson Brief (4 Activities), 1 TEACHER-LED DISCUSSION A New Message from East Ferris, 2 HANDS-ON Water Drop Formation Investigation, 3 HANDS-ON Where the Water Drops Come From: Investigation 1, and 4 STUDENT-TO-STUDENT DISCUSSION Discussing How Water Drops Form. The main content area is divided into three sections: Overview, Digital Resources, and a Unit Anchor Phenomenon. The Overview section provides a detailed description of the lesson's activities and objectives. The Digital Resources section lists various materials available for the lesson, including Classroom Slides, Hands-On Flexextension lesson guides, and The Earth System Investigation Notebook. The Unit Anchor Phenomenon section highlights the relevance of the lesson to the unit's theme.

Amplify. CURRICULUM CLASSWORK REPORTING

Science California > The Earth System > Lesson 2.1

Lesson 2.1:
Investigating Water Drop Formation

Printable Lesson Guide

Lesson Brief (4 Activities)

1 TEACHER-LED DISCUSSION
A New Message from East Ferris

2 HANDS-ON
Water Drop Formation Investigation

3 HANDS-ON
Where the Water Drops Come From: Investigation 1

4 STUDENT-TO-STUDENT DISCUSSION
Discussing How Water Drops Form

RESET LESSON

Overview
Materials & Preparation
Differentiation
Standards
Vocabulary
Unplugged?

Overview

Students begin to investigate why more rain forms over West Ferris than East Ferris. To understand rain formation, students first consider how water drops form. Students observe how drops of water form on the outside of a cup of ice water. To figure out whether the condensation came from the liquid inside the cup, the class tests whether condensation forms on the outside of an empty cold cup. This leads students to realize that the drops on the outside of their cups of ice water did not come from the liquid inside the cups. Finally, students are introduced to the Think-Pair-Share routine. They use this routine to make sense of what conditions are necessary for condensation to occur and they begin to consider where water drops that form on the outside of a cold cup come from. The purpose of this lesson is for students to form initial ideas about condensation.

Unit Anchor Phenomenon: West Ferris has more freshwater than East Ferris.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Hands-On Flexextension lesson guide: Investigating Water Drop Formation
- Hands-On Flexextension copymaster: Investigating Water Drop Formation
- The Earth System Investigation Notebook, pages 12-15
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

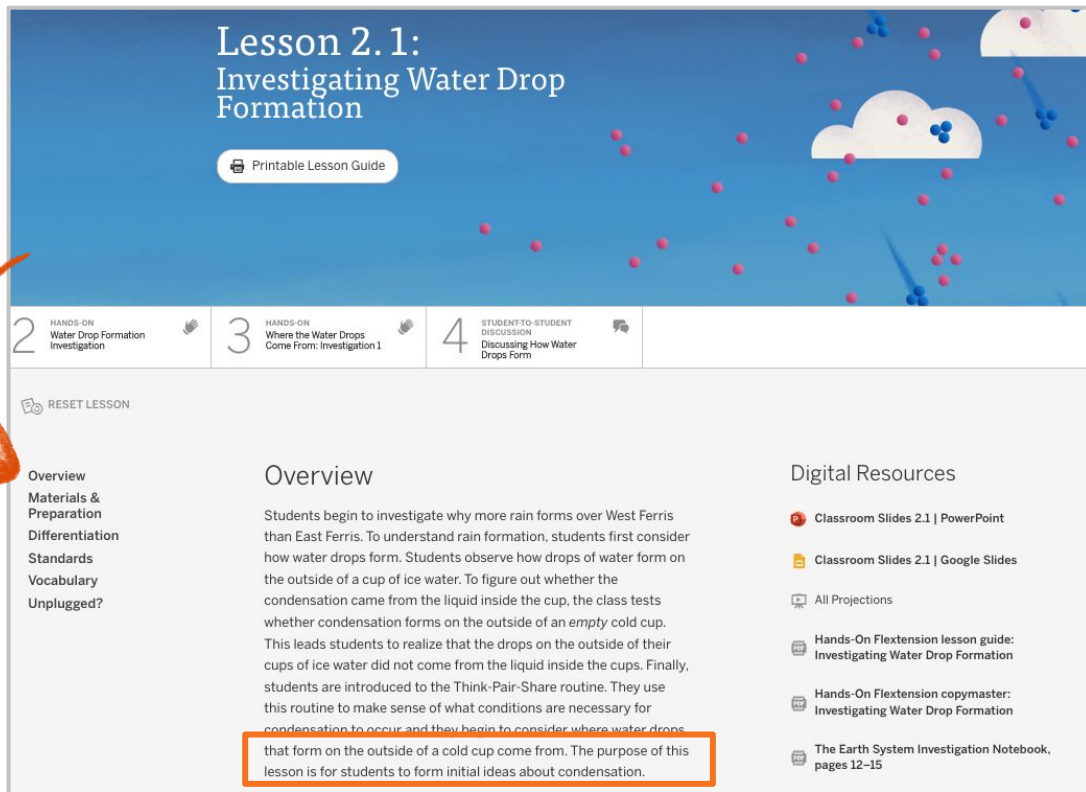
English Español

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?



Lesson 2.1:
Investigating Water Drop Formation

Printable Lesson Guide

2 HANDS-ON
Water Drop Formation
Investigation

3 HANDS-ON
Where the Water Drops
Come From: Investigation 1

4 STUDENT-TO-STUDENT
DISCUSSION
Discussing How Water
Drops Form

RESET LESSON

Overview

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Differentiation

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Overview

Students begin to investigate why more rain forms over West Ferris than East Ferris. To understand rain formation, students first consider how water drops form. Students observe how drops of water form on the outside of a cup of ice water. To figure out whether the condensation came from the liquid inside the cup, the class tests whether condensation forms on the outside of an empty cold cup. This leads students to realize that the drops on the outside of their cups of ice water did not come from the liquid inside the cups. Finally, students are introduced to the Think-Pair-Share routine. They use this routine to make sense of what conditions are necessary for condensation to occur and they begin to consider where water drops that form on the outside of a cold cup come from. The purpose of this lesson is for students to form initial ideas about condensation.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Hands-On Flexextension lesson guide: Investigating Water Drop Formation
- Hands-On Flexextension copymaster: Investigating Water Drop Formation
- The Earth System Investigation Notebook, pages 12–15

Unit Anchor Phenomenon

Problem students work to solve

Chapter-level Anchor Phenomenon

Chapter 2 Question

Investigation Questions

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to the problem

Explanation that students can make to answer the Chapter 2 Question

The Earth System: Investigating Water Shortages

West Ferris has more freshwater than East Ferris.
Why does West Ferris have more freshwater than East Ferris?

West Ferris gets more rain than East Ferris.
Why does more rain form over West Ferris than East Ferris?

How do drops of water form? (2.1- 2.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- Observe drops of water forming on a cup of ice water (2.1)
- Observe drops of water forming on an empty cup that was in the freezer (2.1)
- Observe a cup of ice water sealed in a bag with no air in it (2.2)
- Discuss the gases that make up air (2.2)

- Drops of water can form when enough water vapor gets cold and condenses into liquid water. (2.2)

How do raindrops form? (2.3)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- Read about phases of water in *Water Encyclopedia* (2.3)
- Use the Sim to investigate condensation at the nanoscale (2.3)
- Use the Modeling Tool to create digital nanoscale models of how raindrops form (2.3)

- Raindrops can form when enough water vapor gets cold and condenses into liquid water. (2.3)
- Water molecules are spread apart in water vapor. Water molecules are close together in liquid water. (2.3)

Where does water vapor in the air come from? (2.4-2.6)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- Use the Sim to investigate where water vapor comes from (2.4)
- Observe a water vapor demonstration (2.4)
- Investigate what happens when drops of saltwater and freshwater are exposed to air (2.4-2.5)
- Read *Drinking Cleopatra's Tears* (2.5)
- Engage in a Roundtable Discussion about how raindrops form (2.6)

- Water vapor in the air comes from liquid water that has evaporated. (2.5)
- When water changes from gas to liquid or liquid to gas, water molecules are not created or destroyed. (2.6)

- Write a scientific explanation to answer the Chapter 2 Question (2.6)
- Plan, design, and test freshwater collection systems (2.7)
- Read *Engineering Clean Water* (2.8)
- Reflect on how engineers iterate upon their designs (2.8)

More rain forms over West Ferris because more water vapor condenses there. During condensation, water vapor gets colder and turns into liquid water. There is a lot of water getting cold in West Ferris, so a lot of rain forms. There is not a lot of rain forming over East Ferris, so there is not a lot of water vapor getting colder and condensing into liquid water there.

The Earth System: Investigating Water Shortages

Unit Anchor Phenomenon

Problem students work to solve

Chapter-level Anchor Phenomenon

Chapter 2 Question

Investigation Questions

How do drops of water form? (2.1- 2.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

West Ferris has more freshwater than East Ferris.

Why does West Ferris have more freshwater than East Ferris?

West Ferris gets more rain than East Ferris.
Why does more rain form over West Ferris than East Ferris?

How do drops of water form? (2.1- 2.2)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

- bag with no air in it (2.2)
- Discuss the gases that make up air (2.2)

- Drops of water can form when enough water vapor gets cold and condenses into liquid water. (2.2)

- Write a scientific explanation to answer the Chapter 2 Question (2.6)
- Plan, design, and test freshwater collection systems (2.7)
- Read *Engineering Clean Water* (2.8)
- Reflect on how engineers iterate upon their designs (2.8)

Key concepts

Application of key concepts to the problem

Explanation that students can make to answer the Chapter 2 Question

More rain forms over West Ferris because more water vapor condenses there. During condensation, water vapor gets colder and turns into liquid water. There is a lot of water getting cold in West Ferris, so a lot of rain forms. There is not a lot of rain forming over East Ferris, so there is not a lot of water vapor getting colder and condensing into liquid water there.

- Observe drops of water forming on a cup of ice water (2.1)
- Observe drops of water forming on an empty cup that was in the freezer (2.1)
- Observe a cup of ice water sealed in a bag with no air in it (2.2)
- Discuss the gases that make up air (2.2)

**Unit Anchor
Phenomenon**
Problem students work
to solve

The Earth System: Investigating Water Shortages

West Ferris has more freshwater than East Ferris.
Why does West Ferris have more freshwater than East Ferris?

- Drops of water can form when enough water vapor gets cold and condenses into liquid water. (2.2)

- Drops of water can form when enough water vapor gets cold and condenses into liquid water. (2.2)

- Water molecules are spread apart in water vapor. Water molecules are close together in liquid water. (2.3)

- Water vapor in the air comes from liquid water that has evaporated. (2.5)
- When water changes from gas to liquid or liquid to gas, water molecules are not created or destroyed. (2.6)

Application of key
concepts to the problem

- Write a scientific explanation to answer the Chapter 2 Question (2.6)
- Plan, design, and test freshwater collection systems (2.7)
- Read *Engineering Clean Water* (2.8)
- Reflect on how engineers iterate upon their designs (2.8)

Explanation that students
can make to answer the
Chapter 2 Question

More rain forms over West Ferris because more water vapor condenses there. During condensation, water vapor gets colder and turns into liquid water. There is a lot of water getting cold in West Ferris, so a lot of rain forms. There is not a lot of rain forming over East Ferris, so there is not a lot of water vapor getting colder and condensing into liquid water there.

Printable Resources

Coherence Flowcharts

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

Printable Resources



3-D Assessment Objectives



Copymaster Compilation



Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds



Investigation Notebook



NGSS Information for Parents and Guardians



Print Materials (11" x 17")



Coherence Flowcharts



Crosscutting Concept Tracker



Flextension Compilation



Multi-Language Glossary



Print Materials (8.5" x 11")



Formative Assessments: Monitoring Students Progress

Preparing Students For Lesson 2.1

On-the-Fly Assessments

Lesson 1.2, Activity 4

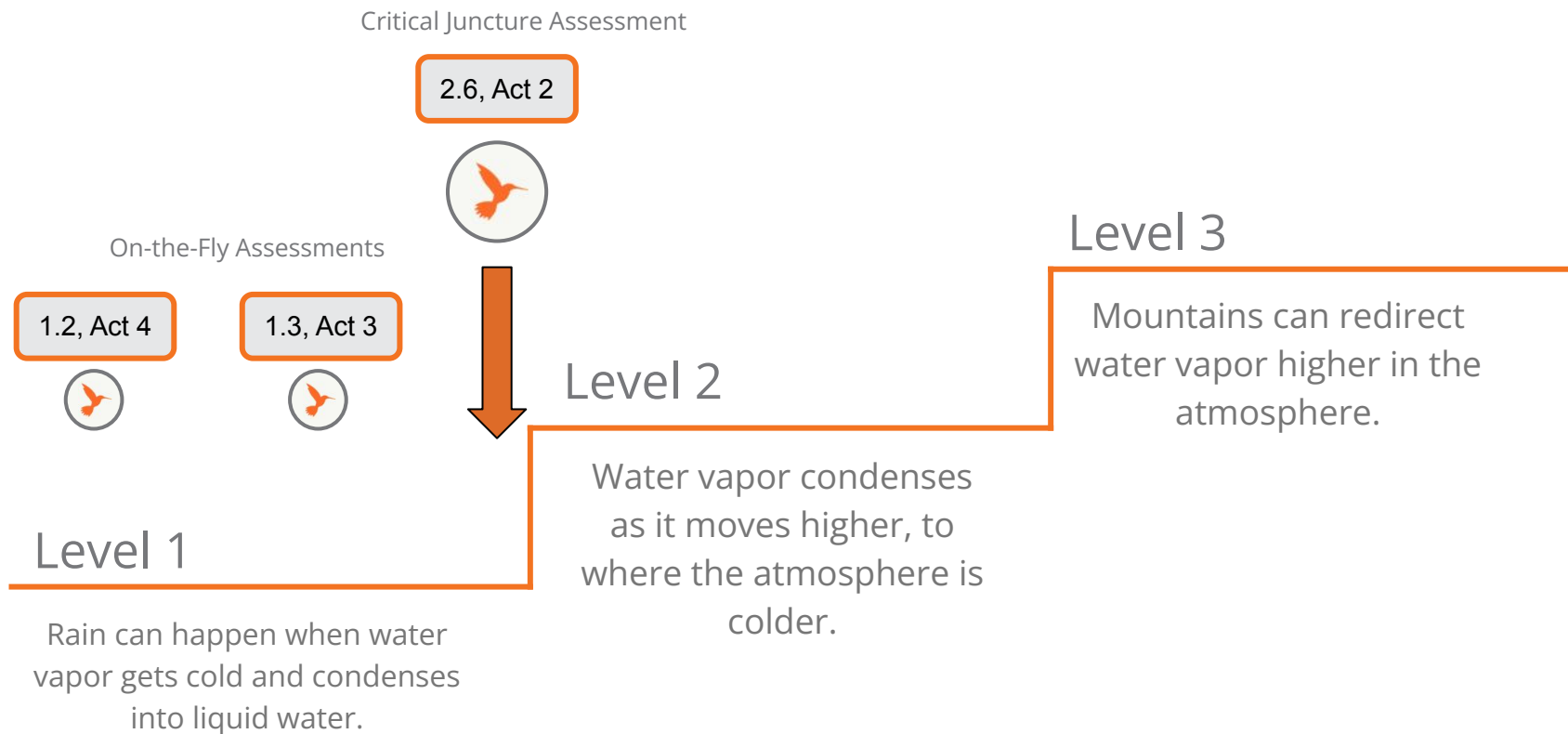
- Synthesizing ideas
- Human needs for freshwater
- The limited amount of freshwater on Earth

Lesson 1.3, Activity 3

- Water availability is affected by both inflow and outflow
- If people use more water than comes into their area, there will be a water shortage
- Constructing explanations


Unit Overview Chapters Printable Resources Planning for the Unit ▾ 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 Flextensions in This Unit Offline Preparation	On-the-Fly Assessments at a Glance	
	On-the-Fly Assessment	Assessment Focus
	On-the-Fly Assessment 1: Synthesizing Ideas (Lesson 1.2, Activity 4)	<ul style="list-style-type: none">• Synthesizing ideas• Human needs for freshwater• The limited amount of freshwater on Earth
	On-the-Fly Assessment 2: Explanations About Water Availability (Lesson 1.3, Activity 3)	<ul style="list-style-type: none">• Water availability is affected by both inflow and outflow• If people use more water than comes into their area, there will be a water shortage• Constructing explanations
	On-the-Fly Assessment 3: Early Understandings of Condensation (Lesson 2.2, Activity 1)	<ul style="list-style-type: none">• How water drops form
	On-the-Fly Assessment 4: Raindrop Formation at the Nanoscale (Lesson 2.3, Activity 4)	<ul style="list-style-type: none">• Condensation at the nanoscale• Modeling
	On-the-Fly Assessment 5: Evaporation and the Atmosphere (Lesson 2.4, Activity 4)	<ul style="list-style-type: none">• Evaporation• Water vapor comes from liquid water that moves into the atmosphere• Systems• Constructing explanations

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



Planning Lesson 2.1


Lesson 2.1: Investigating Water Drop Formation

 Printable Lesson Guide

2 HANDS-ON
Water Drop Formation
Investigation

3 HANDS-ON
Where the Water Drops
Come From: Investigation 1

4 STUDENT-TO-STUDENT
DISCUSSION
Discussing How Water
Drops Form

 RESET LESSON

Overview

Materials & Preparation

Differentiation

Standards

Vocabulary

Unplugged?


Overview


Students begin to investigate why more rain forms over West Ferris than East Ferris. To understand rain formation, students first consider how water drops form. Students observe how drops of water form on the outside of a cup of ice water. To figure out whether the condensation came from the liquid inside the cup, the class tests whether condensation forms on the outside of an *empty* cold cup. This leads students to realize that the drops on the outside of their cups of ice water did not come from the liquid inside the cups. Finally, students are introduced to the Think-Pair-Share routine. They use this routine to make sense of what conditions are necessary for condensation to occur and they begin to consider where water drops that form on the outside of a cold cup come from. The purpose of this lesson is for students to form initial ideas about condensation.


Unit Anchor Phenomenon: West Ferris has more freshwater than East Ferris.


Chapter-level Anchor Phenomenon: West Ferris gets more rain than East Ferris.


Digital Resources


 Classroom Slides 2.1 | PowerPoint


 Classroom Slides 2.1 | Google Slides

 All Projections

 Hands-On Flexextension lesson guide: Investigating Water Drop Formation

 Hands-On Flexextension copymaster: Investigating Water Drop Formation

 The Earth System Investigation Notebook, pages 12–15

 Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

Planning Lesson 2.1

Lesson Brief

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

Lesson 2.1: Investigating Water Drop Formation

Printable Lesson Guide

2

HANDS-ON
Water Drop Formation
Investigation

3

HANDS-ON
Where the Water Drops
Come From: Investigation 1

4

STUDENT-TO-STUDENT
DISCUSSION
Discussing How Water
Drops Form

RESET LESSON

Overview

Materials & Preparation

Differentiation

Standards

Vocabulary

Unplugged?

Overview

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Unit Anchor Phenomenon: West Ferris has more freshwater than East Ferris.

Chapter-level Anchor Phenomenon: West Ferris gets more rain than East Ferris.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Hands-On Flexextension lesson guide: Investigating Water Drop Formation
- Hands-On Flexextension copymaster: Investigating Water Drop Formation
- The Earth System Investigation Notebook, pages 12–15
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

Planning Lesson 2.1

Lesson Brief

Step 2: Read the Overview.

The Purpose of this Lesson: To form initial ideas about condensation.

Learning Objectives

Lesson 2.1: Investigating Water Drop Formation

Printable Lesson Guide

4 STUDENT-TO-STUDENT DISCUSSION Discussing How Water Drops Form

RESET LESSON

- Overview
- Materials & Preparation
- Differentiation
- Standards
- Vocabulary
- Unplugged?

Overview

Students begin to investigate why more rain forms over West Ferris than East Ferris. To understand rain formation, students first consider how water drops form. Students observe how drops of water form on the outside of a cup of ice water. To figure out whether the condensation came from the liquid inside the cup, the class tests whether condensation forms on the outside of an empty cold cup. This leads students to realize that the drops on the outside of their cups of ice water did not come from the liquid inside the cups. Finally, students are introduced to the Think-Pair-Share routine. They use this routine to make sense of what conditions are necessary for condensation to occur and they begin to consider where water drops that form on the outside of a cold cup come from. The purpose of this lesson is for students to form initial ideas about condensation.

Unit Anchor Phenomenon: West Ferris has more freshwater than East Ferris.

Chapter-level Anchor Phenomenon: West Ferris gets more rain than East Ferris.

Investigative Phenomenon: Drops of water form on the outside of a cup of ice water.

Students learn:

- Drops of water can form on cold surfaces.
- For water drops to form on a cup, it must be cold.
- Water drops that form on a cup do not come from water or ice inside the cup.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- Classroom Slides 2.1 | Google Slides
- All Projections
- Hands-On Flexension lesson guide: Investigating Water Drop Formation
- Hands-On Flexension copymaster: Investigating Water Drop Formation
- The Earth System Investigation Notebook, pages 12–15
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural 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	Digital Resources
Overview		
Materials & Preparation		 Classroom Slides 2.1 PowerPoint
Differentiation		 Classroom Slides 2.1 Google Slides
Standards		 All Projections
Vocabulary		 Hands-On Flexextension lesson guide: Investigating Water Drop Formation
Unplugged?		 Hands-On Flexextension copymaster: Investigating Water Drop Formation
	1: A New Message from East Ferris (5 min.) Students receive a message from Mayor McKnight about rain on Ferris Island. The message motivates students to investigate how water drops form.	
	2: Water Drop Formation Investigation (30 min.) Students engage in close observation of what happens on the outside of a cup of ice water, watching as drops of liquid water form. This opportunity to observe as condensation forms on the outside of a cup provides students with important firsthand experience and evidence of how the water drops form.	
	3: Where the Water Drops Come From: Investigation 1 (10 min.) The class brainstorms how they could answer the question of whether the liquid drops that form on the outside of a cup of ice water come from the water that is <i>inside</i> the cup. They observe a cold, empty cup taken out of a freezer and see that condensation can form even in the absence of liquid water. This leads to their realization that the drops on the outside of their cups of ice water did not come from the liquid inside the cups.	 The Earth System Investigation Notebook, pages 12–15
	4: Discussing How Water Drops Form (10 min.) By reflecting on why water formed on the cups and where it came from with the Think-Pair-Share discussion routine, students conclude that the water on the outside of their cups did not come from inside the cup and that it had to do with the cups being cold.	 Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

Lesson at a Glance: Pacing

Day 1: (35 minutes)

Act 1: A new Message from East Ferris
(5 min)

Act 2: Water Drop formation Investigation
(30 min)

Day 2: (25 minutes)

Act 3: Where the Water Drops Come From:
Investigation (10 min)

Act 4: Discuss How Water Drops Form
(10 min)

Overview

Materials &
Preparation
Differentiation
Standards
Vocabulary
Unplugged?

Lesson at a Glance

1: A New Message from East Ferris (5 min.)

Students receive a message from Mayor McKnight about rain on Ferris Island. The message motivates students to investigate how water drops form.

2: Water Drop Formation Investigation (30 min.)

Students engage in close observation of what happens on the outside of a cup of ice water, watching as drops of liquid water form. This opportunity to observe as condensation forms on the outside of a cup provides students with important firsthand experience and evidence of how the water drops form.

3: Where the Water Drops Come From: Investigation 1 (10 min.)

The class brainstorms how they could answer the question of whether the liquid drops that form on the *outside* of a cup of ice water come from the water that is *inside* the cup. They observe a cold, empty cup taken out of a freezer and see that condensation can form even in the absence of liquid water. This leads to their realization that the drops on the outside of their cups of ice water did not come from the liquid inside the cups.

4: Discussing How Water Drops Form (10 min.)


By reflecting on why water formed on the cups and where it came from with the Think-Pair-Share discussion routine, students conclude that the water on the outside of their cups did not come from inside the cup and that it had to do with the cups being cold.


Digital Resources


 Classroom Slides 2.1 | PowerPoint


 Classroom Slides 2.1 | Google Slides

 All Projections

 Hands-On Flexextension lesson guide:
Investigating Water Drop Formation

 Hands-On Flexextension copymaster:
Investigating Water Drop Formation

 The Earth System Investigation Notebook,
pages 12–15

 Eliciting and Leveraging Students' Prior
Knowledge, Personal Experiences, and Cultural
Backgrounds

Planning for Pacing - The Earth System (Example)

Sample time in my Science block.	Day 1 (35 min)	Day 2 (25 min)	Day 3 (35 min)	Day 4 (40 min)	Day 5 (45 min)
	2.1: Investigating Water Drop Formation Activity 1: A new Message from east Ferris (5 min.) Activity 2: Water Drop Formation Investigation (30 min)	2.1 cont. Activity 3: Where the Water Drops Come From: Investigation (10 min.) Activity 4: Discussing How Water Drops From (10 min.)	2.2 From Water vapor to Liquid Water Activity 1: Where the Water Drops Come From: Investigation(20 min.) Activity 2: What's in teh Air(15 min)	2.2 cont. Activity 3: Recording Investigation Results (15 min) Activity 4: Discussing how Raindrops From (10 min) 2.3: A Nanoscale View of Condensation Activity 1: Reading About Phases of Water (15 min)	2.3: cont. Activity 2: Exploring The Earth System Simulation (15 min) Activity 3: Investigating Condensation in the SIM (15 min) Activity 4: Reflecting on Raindrops (15 min)

Week 1 Pacing

Monday

Tuesday

Wednesday

Thursday

Friday



<http://bit.ly/3Xx4S18>

Planning Lesson 2.1

Lesson Brief

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



Lesson Investigation Form

Printable

2 HANDS-ON Water Drop Formation Investigation

3 HANDS-ON Where Does Water Come From?

RESET LESSON

Overview

Materials & Preparation

Differentiation

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Unplugged?

Unit 1: Earth's Systems

Chapter 2: Earth's Systems

Materials & Preparation

Materials

For the Classroom Wall

- Chapter 2 Question: *Why does more rain form over West Ferris than East Ferris?*

For the Class

- plastic cups, 9 oz.
- hand lenses*
- 2 identical glass cups, any size*
- plastic trays*
- 1 cooler*
- 1 pitcher*
- water*
- ice*
- masking tape*

For Each Group of Four Students

- 1 plastic tray*
- 2 plastic cups with water
- 2 hand lenses*

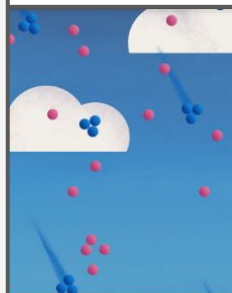
For Each Pair of Students

- 3 ice cubes*

For Each Student

- The Earth System Investigation Notebook* (pages 12–15)

*teacher provided



Resources

om Slides 2.1 | PowerPoint

om Slides 2.1 | Google Slides

ctions

On Flexension lesson guide:
ating Water Drop Formation

On Flexension copymaster:
ating Water Drop Formation

th System Investigation Notebook,
2–15

g and Leveraging Students' Prior
dge, Personal Experiences, and Cultural
unds

Planning Lesson 2.1

Lesson Brief

Read the **Materials & Preparation**.

Materials & Preparation

Chapter 2 Question

Why does more rain form over West Ferris than East Ferris?

Planning Lesson 2.1

Lesson Brief

Read the **Materials & Preparation.**

Teacher Provided*

For the Class

- plastic cups, 9 oz.
- hand lenses*
- 2 identical glass cups, any size*
- plastic trays*
- 1 cooler*
- 1 pitcher*
- water*
- ice*
- masking tape*

Planning Lesson 2.1

Lesson Brief

Read the **Materials & Preparation**.

For Each Group of Four Students

- 1 plastic tray*
- 2 plastic cups with water
- 2 hand lenses*

For Each Pair of Students

- 3 ice cubes*

For Each Student

- *The Earth System* Investigation Notebook (pages 12–15)

*teacher provided

Planning Lesson 2.1

Lesson Brief

Read the **Materials & Preparation.**

Before the Day of the Lesson

1. **Review the optional Hands-On Flexextension: Investigating Water Drop Formation and decide if you will teach it in lieu of this and the following lesson (2.1 and 2.2).** This two or three day Flexextension provides more challenging, messier, and open-ended alternatives to the activities in Lessons 2.1 and 2.2, which support students in constructing an understanding of condensation. The Flexextension lesson guide and Flexextension copymaster are available in Digital Resources.

2. **Gather the following item for the classroom wall:**

- Chapter 2 Question: *Why does more rain form over West Ferris than East Ferris?*

3. **Locate (in your *The Earth System* kit) the plastic cups.** You will also need to provide hand lenses, plastic trays, two identical glass cups, one cooler, one pitcher, water, masking tape, and enough ice cubes for each pair of students to have three.

4. **Review Activities 2 and 3.** For these activities, you will need to prepare materials for the Water Drop Formation Investigation and Where the Water Drops Come From: Investigation 1. (Note that Where the Water Drops Come From: Investigation 2 will take place in Lesson 2.2.) Read this Preparation section carefully and review the activities to familiarize yourself with what needs to be done before the day of the class, immediately before the lesson, and during the activities.

5. **Prepare ice cubes and frozen glass cup.** In Activity 2, students will observe condensation on an ice water cup. Each pair of students will need about three ice cubes. Prepare or obtain enough ice for each pair. Store them in a freezer until immediately before the lesson. In Activity 3, you will do the Where the Water Drops Come From Investigation. Place one empty glass cup in a freezer.

6. **Test condensation in your classroom.** In Activity 2, student pairs will observe condensation that forms on the outside of a cup of ice water. Test this activity in advance to ensure that condensation will form, and will do so within several minutes. Fill a plastic cup halfway with water, add three ice cubes, and observe the side of the cup to see if condensation appears. Depending on the temperature and humidity of your classroom, you may need to provide more ice cubes to student pairs so that condensation will occur during the lesson.

Planning Lesson 2.1

Lesson Brief

Step 3: Read the **Differentiation** document



Lesson 2.1: Investigating Water Drop Formation

[Printable Lesson Guide](#)

2

HANDS-ON
Water Drop Formation
Investigation

3

HANDS-ON
Where the Water Drops
Come From: Investigation 1

4

STUDENT-TO-STUDENT
DISCUSSION
Discussing How Water
Drops Form

[RESET LESSON](#)

Overview

Materials & Preparation

Differentiation

Standards

Vocabulary

Unplugged?

Overview

Students begin to investigate why more rain forms over West Ferris than East Ferris. To understand rain formation, students first consider how water drops form. Students observe how drops of water form on the outside of a cup of ice water. To figure out whether the condensation came from the liquid inside the cup, the class tests whether condensation forms on the outside of an *empty* cold cup. This leads students to realize that the drops on the outside of their cups of ice water did not come from the liquid inside the cups. Finally, students are introduced to the Think-Pair-Share routine. They use this routine to make sense of what conditions are necessary for condensation to occur and they begin to consider where water drops that form on the outside of a cold cup come from. The purpose of this lesson is for students to form initial ideas about condensation.

Unit Anchor Phenomenon: West Ferris has more freshwater than East Ferris.

Chapter-level Anchor Phenomenon: West Ferris gets more rain than East Ferris.

Digital Resources

- [Classroom Slides 2.1 | PowerPoint](#)
- [Classroom Slides 2.1 | Google Slides](#)
- [All Projections](#)
- [Hands-On Flexextension lesson guide: Investigating Water Drop Formation](#)
- [Hands-On Flexextension copymaster: Investigating Water Drop Formation](#)
- [The Earth System Investigation Notebook, pages 12–15](#)
- [Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds](#)

Planning Lesson 2.1

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
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Differentiation

Embedded Supports for Diverse Learners

Discourse routine. In this lesson, students engage in the Think-Pair-Share routine. Before students are asked to discuss their ideas with the class, they have an opportunity to think silently and discuss with a partner. This provides time for students to prepare their thoughts before sharing with the class. Think-Pair-Share can be especially helpful for English learners, as they will have a chance to hear language modeled by their peers in a low-stakes setting.


Firsthand investigation. This lesson includes firsthand investigation, in which students engage in the Water Drop Formation Investigation and Where the Water Drops Come From: Investigation 1. Firsthand investigations provide students with direct experience of science phenomena, which serves as evidence for constructing understanding of key science concepts. Observing science phenomena firsthand provides different types of learners with a shared experience and facilitates discourse around core science ideas.

Student-to-student discussions. This lesson includes multiple opportunities for students to discuss and share their ideas. Students will likely have with very different experiences and understandings about condensation from their everyday lives, so providing frequent student-to-student discussion opportunities allows students to learn from one another. As students discuss their ideas during the Water Drop Formation Investigation, the Where the Water Drops Come From: Investigation 1, and the Think-Pair-Share activity, you can listen for alternate conceptions and either address them in the moment or make a plan for addressing them during later lessons. This strategy is especially effective when students have a range of background knowledge.

Potential Challenges in This Lesson

Physical materials. The Water Drop Formation Investigation contains various materials for students to work with. Some students may have difficulty focusing on the purpose of the activity and working with a partner when they have intriguing materials in front of them. Consider ways you can make expectations clear ahead of time and support students in focusing their efforts on the specific goals for this activity.

Following multistep procedures. In the Water Drop Formation Investigation, students follow multistep procedures. If you have students who have difficulty following a written set of instructions, consider how you can support these students during the activity.



**Now we are
ready to teach
the lesson.**

An illustration depicting the process of water drop formation. In the upper left, three white, fluffy clouds are shown against a blue sky. From these clouds, blue lines representing rain fall towards the bottom left. The background is a gradient of blue, with numerous small red dots scattered throughout, representing water vapor. On the left side, there are stylized green and brown hills. The overall scene is a simplified representation of the water cycle.

Grade 5 | The Earth System

Lesson 2.1: Investigating Water Drop Formation

Activity 1

A New Message from East Ferris





To: Water Resource Engineers

From: Mayor McKnight, East Ferris City Hall

Subject: Rain on Ferris Island

We discussed the water shortage at a recent town hall meeting. I shared your explanations about why East Ferris is running out of water while West Ferris is not. People now understand that East Ferris gets freshwater from the island's groundwater reservoir, and that the people of East Ferris are using more water than is going into the reservoir. Now, many people are wondering why West Ferris gets so much more rain than East Ferris. Could you explain why West Ferris gets more rain than East Ferris? Thank you.



Chapter 2 Question

Why does more rain form over West Ferris than East Ferris?

Today, we are going to investigate this question:

How do drops of water form?



How do you think **drops of water form?**

Think about what you have noticed when it has rained.

I think drops of water form by _____.

Drops of water form by _____.

Activity 2

Water Drop Formation Investigation





Raise your hand if you can think of a time when you have noticed drops of water forming.



Raise your hand if you have observed drops of water forming on the outside of a glass containing a cold drink.



We'll use these materials to **investigate how drops form** on the outside of a glass and where the drops come from.

Name: _____ Date: _____

Water Drop Formation Investigation

1. Use a hand lens to observe the outside of the cup with water in it.
2. Answer Question 1.
3. Add ice to your cup. Use a hand lens to observe the outside of the cup again and discuss what you observe with your partner.
4. Answer Question 2.
5. Observe the cup for a few more minutes and discuss any changes that you notice with your partner.
6. Answer Question 3.
7. Label the image to show what you observed on the outside of the cup.

Question 1: What does the outside of the cup look and feel like?

Question 2: What did you observe on the outside of the cup right after ice was added?

Question 3: What did you observe on the outside of the cup several minutes after ice was added?

Turn to page 14 in your notebooks.

You will **observe** the outside of a cup of water. With your partner, you will **discuss** what happens and answer the questions.

Name: _____ Date: _____

Water Drop Formation Investigation (continued)

Label this image to show what you observed after the ice was in the cup for several minutes.



Turn to page 15 in your notebooks.

You will focus on drawing what you **observe** on the **outside** of the cup, not on the inside.

Name: _____ Date: _____

Water Drop Formation Investigation

1. Use a hand lens to observe the outside of the cup with water in it.
2. Answer Question 1.
3. Add ice to your cup. Use a hand lens to observe the outside of the cup again and discuss what you observe with your partner.
4. Answer Question 2.
5. Observe the cup for a few more minutes and discuss any changes that you notice with your partner.
6. Answer Question 3.
7. Label the image to show what you observed on the outside of the cup.

Question 1: What does the outside of the cup look and feel like?

Question 2: What did you observe on the outside of the cup right after ice was added?

Question 3: What did you observe on the outside of the cup several minutes after ice was added?



Use the hand lens to
observe the cup with
water.

**Answer Question 1 on
page 14 in your
notebooks.**

Name: _____ Date: _____

Water Drop Formation Investigation

1. Use a hand lens to observe the outside of the cup with water in it.
2. Answer Question 1.
3. Add ice to your cup. Use a hand lens to observe the outside of the cup again and discuss what you observe with your partner.
4. Answer Question 2.
5. Observe the cup for a few more minutes and discuss any changes that you notice with your partner.
6. Answer Question 3.
7. Label the image to show what you observed on the outside of the cup.

Question 1: What does the outside of the cup look and feel like?

Question 2: What did you observe on the outside of the cup right after ice was added?

Question 3: What did you observe on the outside of the cup several minutes after ice was added?

I will now add ice to your cups.



Use the hand lens to observe the cup again.

Answer the remaining questions.

Name: _____ Date: _____

Water Drop Formation Investigation (continued)

Label this image to show what you observed after the ice was in the cup for several minutes.



The Earth System—Lesson 2.1

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15



Draw to show what you observed on the outside of the cup. Remember to **add labels** to your drawing.

Activity 3

Where the Water Drops Come From: Investigation 1





What did you **observe** in the last investigation?

Why do you think the **water drops** formed after we added ice to the cups?



Where do you think the
water on the outside of
the cup came from?

I think the water on the outside of the cup came from

_____.



What **investigation** could we do to figure out whether the drops came from the water **inside the cup**?

I think we can _____.

An investigation we could do is _____.



This cup has **water** in it that is **room temperature**, but there is no water on the outside of the cup.



If we **added ice** to this water, **would drops of water appear?** Why do you think so?

I think if we added ice to this water _____

because _____.



If we put this **empty cup** in the **freezer** for a while and then take it out and observe it for a while, **will drops of water appear?** Why or why not?

I think _____ because _____.



I already prepared this investigation. Here is the **empty cup that was in the freezer**. Observe it carefully.



Why do you think **drops**
of water **appeared** on the
outside of this empty
cup?

I think drops of water appeared on the outside of this
empty cup because _____.

Activity 4

Discussing How Water Drops Form



Remember that we are investigating this question:

How do drops of water form?

Think-Pair-Share Routine



Think

Think silently about the question.



Pair

Turn and talk to a partner about the question.



Share

Share your ideas about the question with the class.



Do you think the **water** on the **outside** of the cup comes directly from the **water and ice** on the **inside** of the cup?

Why or why not?

I think _____ because _____.



Where did the **water** on the **outside** of the cup come from?

I think the water on the outside of the cup comes from _____.



Why is there water on the cup **with ice** in it, but not on the cup **without ice** in it?

I think the reason why there is water on the cup with ice in it, but not on the cup without ice in it is because _____.

We think the water drops forming had something to do with the **cup being cold**.

We know that the water drops **could not come from inside the cup** because they formed on the cold empty cup.

End of Lesson



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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

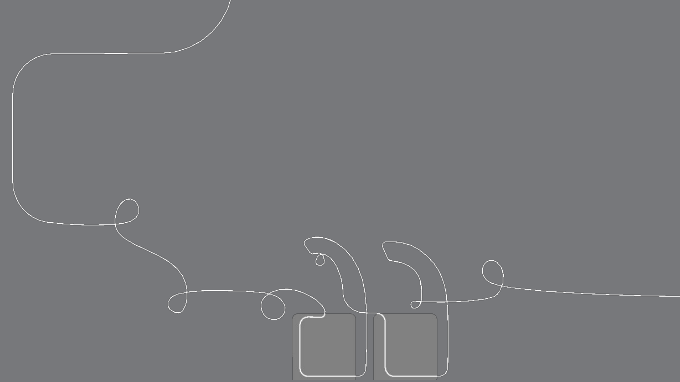


Share out

- 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

**Let's connect
this goal to
our students**

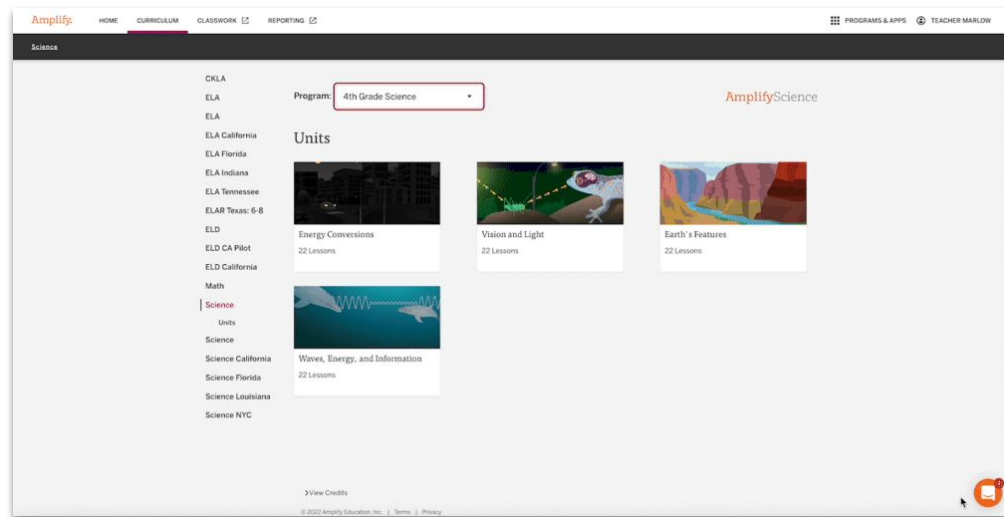


Additional resources and ongoing support

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



Closing reflection

Based on our work today in Part 2, share:

Head: something you'll keep in mind

Heart: something you're feeling

Feet: something you're planning to do