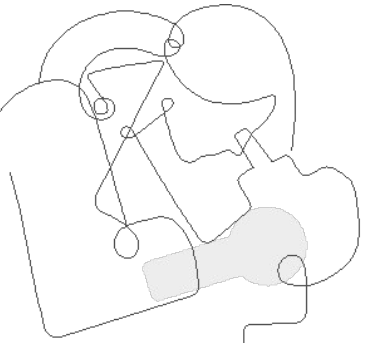
Amplify Science

Unit Internalization / Guided Planning

Grade 5, Unit 3: The Earth System

Part 1



School/District Name: LAUSD
Date:
Presented by:

TOP RATED BY EDREPORTS

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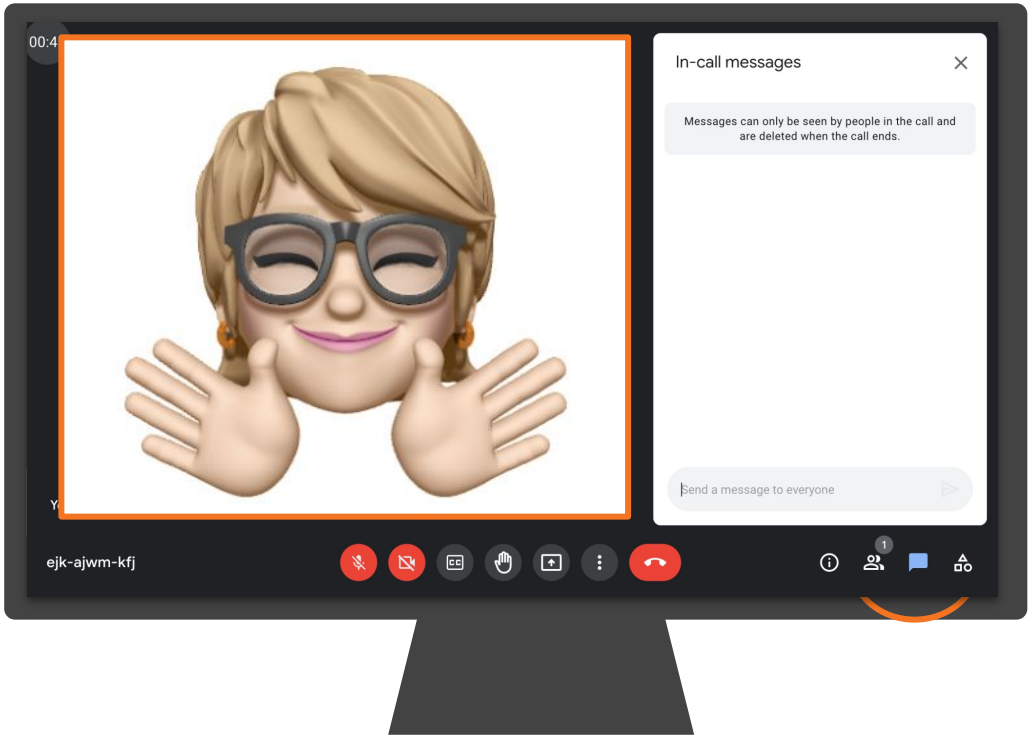
Ice Breaker!

Who do we have in the room today?

- Share your experience with Amplify Science so far.



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.

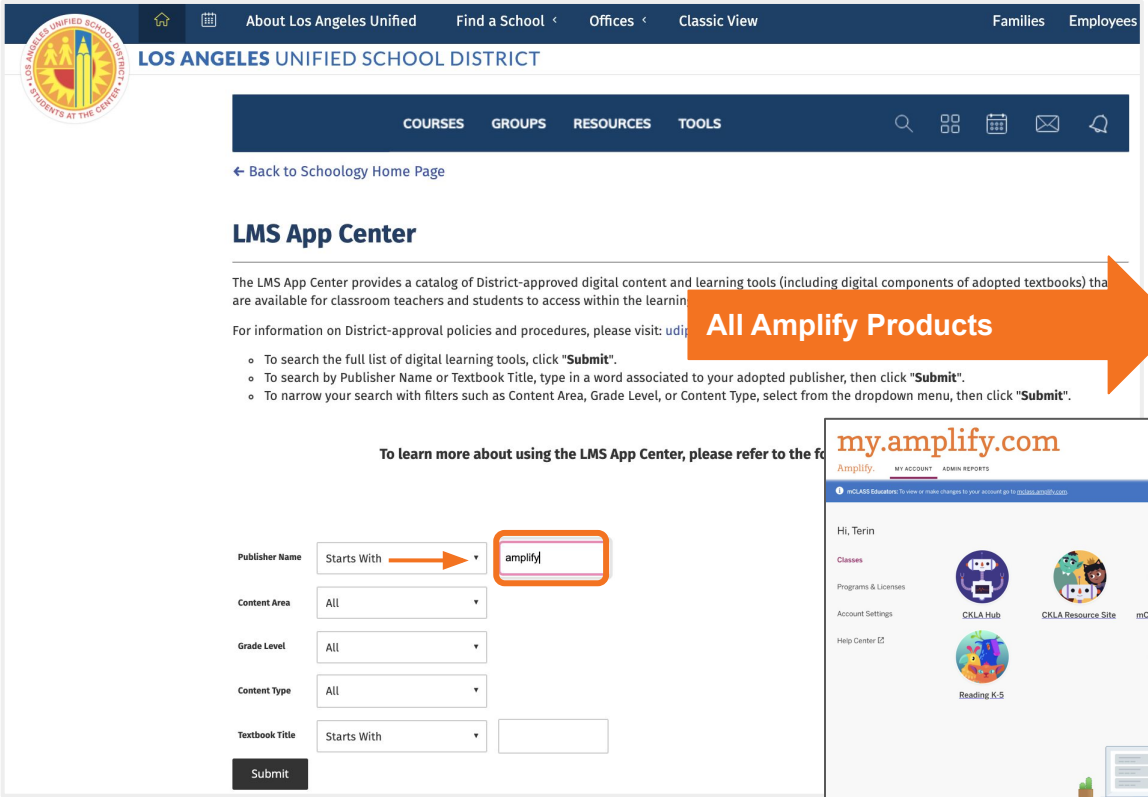
We share your goal of **inspiring all students to think deeply, creatively, and for themselves.**

Sincerely,
Amplify

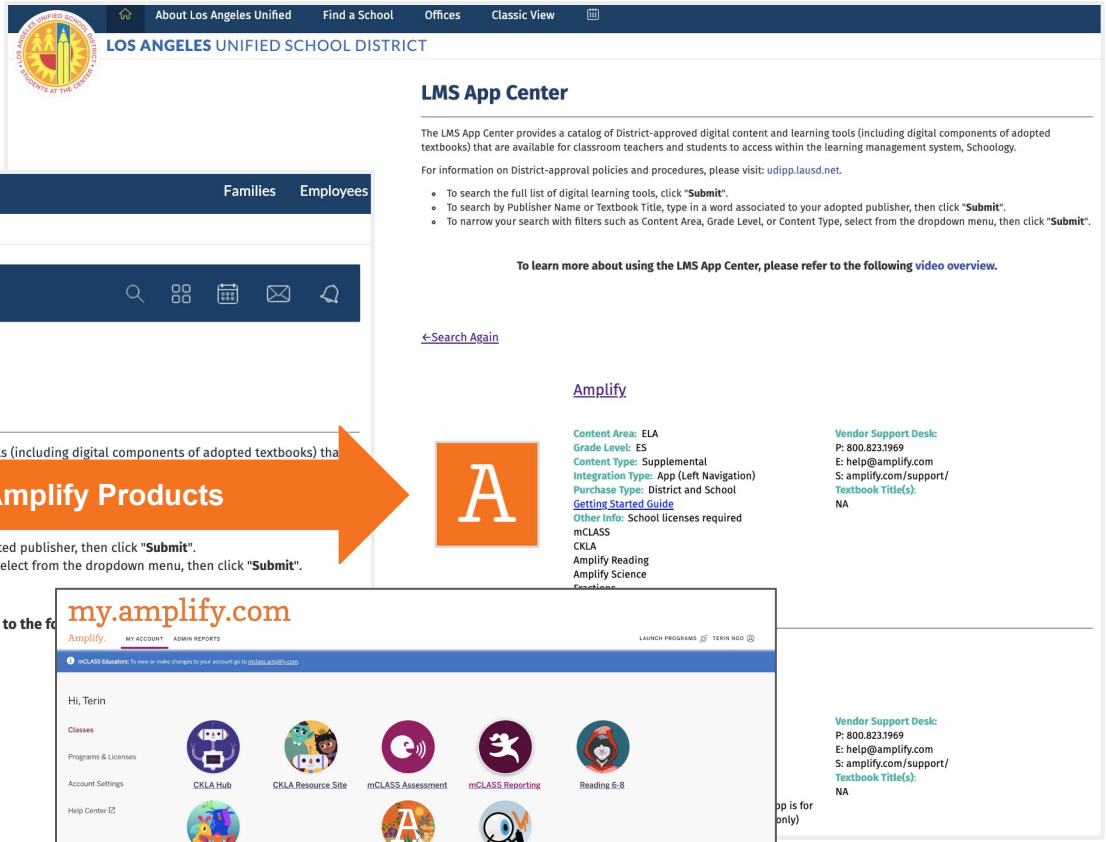
Norms: Establishing a culture of learners

- **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



my.amplify.com

Amplify. MY ACCOUNT ADMIN REPORTS LAUNCH PROGRAMS TERIN NGO

mCLASS Educators: To view or make changes to your account go to mclass.amplify.com.

Hi, Terin

Classes

Programs & Licenses

Account Settings

Help Center

CKLA Hub

CKLA Resource Site

mCLASS Assessment

mCLASS Reporting

Reading 6-8

Reading K-5

Science

Vocabulary

Amplify. on Schoology

2021-2022

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.

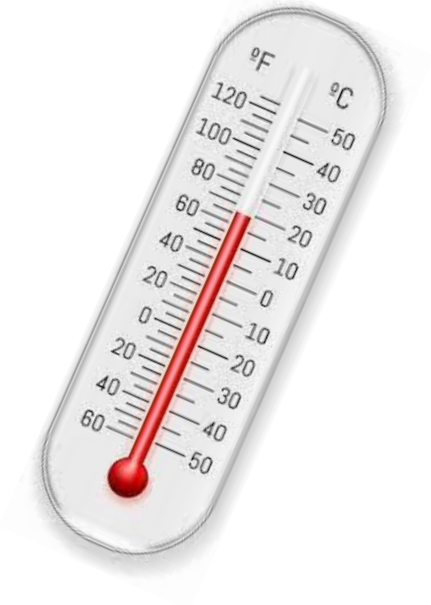
1 = Extremely Uncomfortable

2 = Uncomfortable

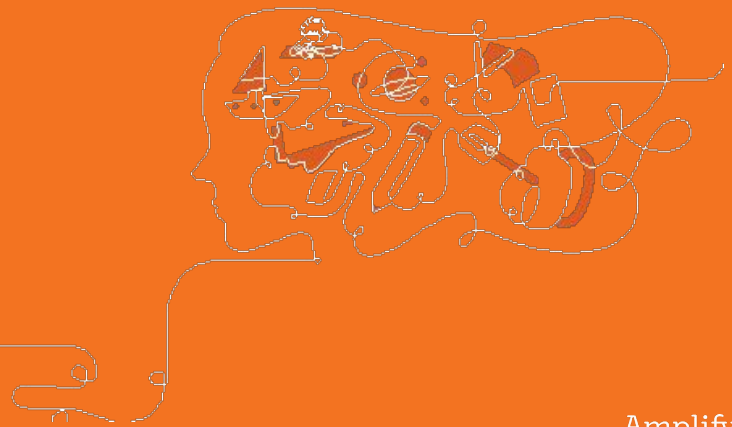
3 = Mild

4 = Comfortable

5 = Extremely Comfortable

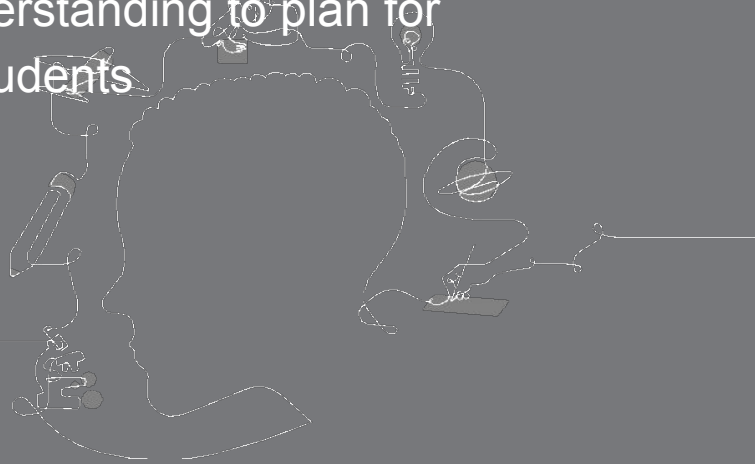


Part 1



Overarching goals

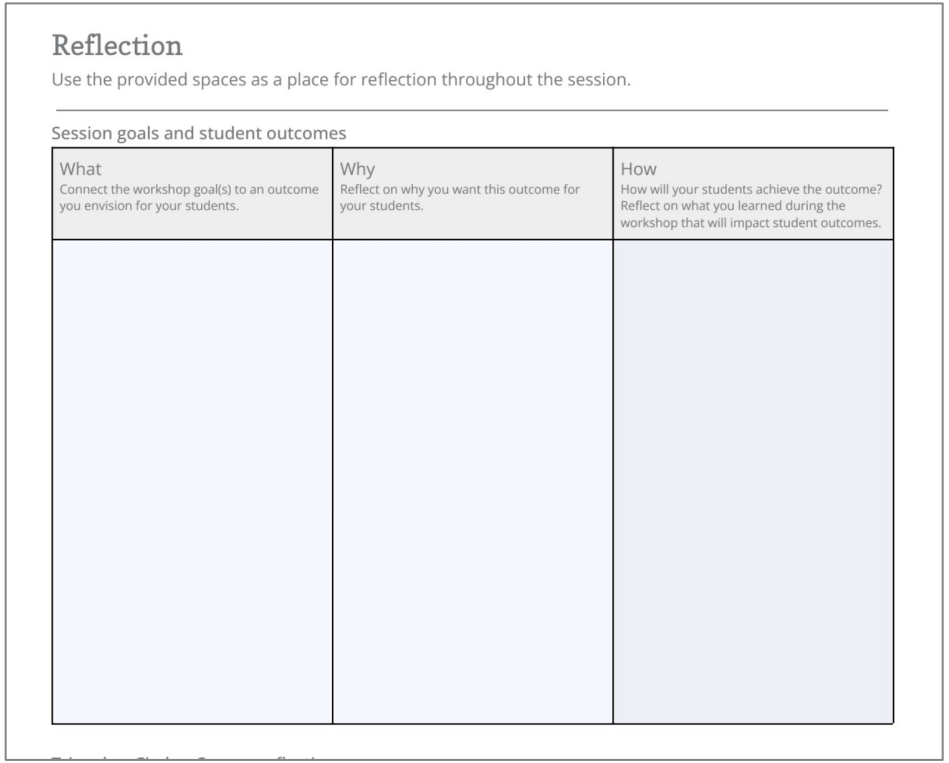
- ❏ Explain how students engage in phenomenon based and 3D learning to construct an understanding of the science concepts introduced in *Earth System.*
- ❏ Internalize the unit and apply your new understanding to plan for the diverse needs of your classroom and students



Opening Reflection

What are your goals
for student outcomes?

Participant Notebook

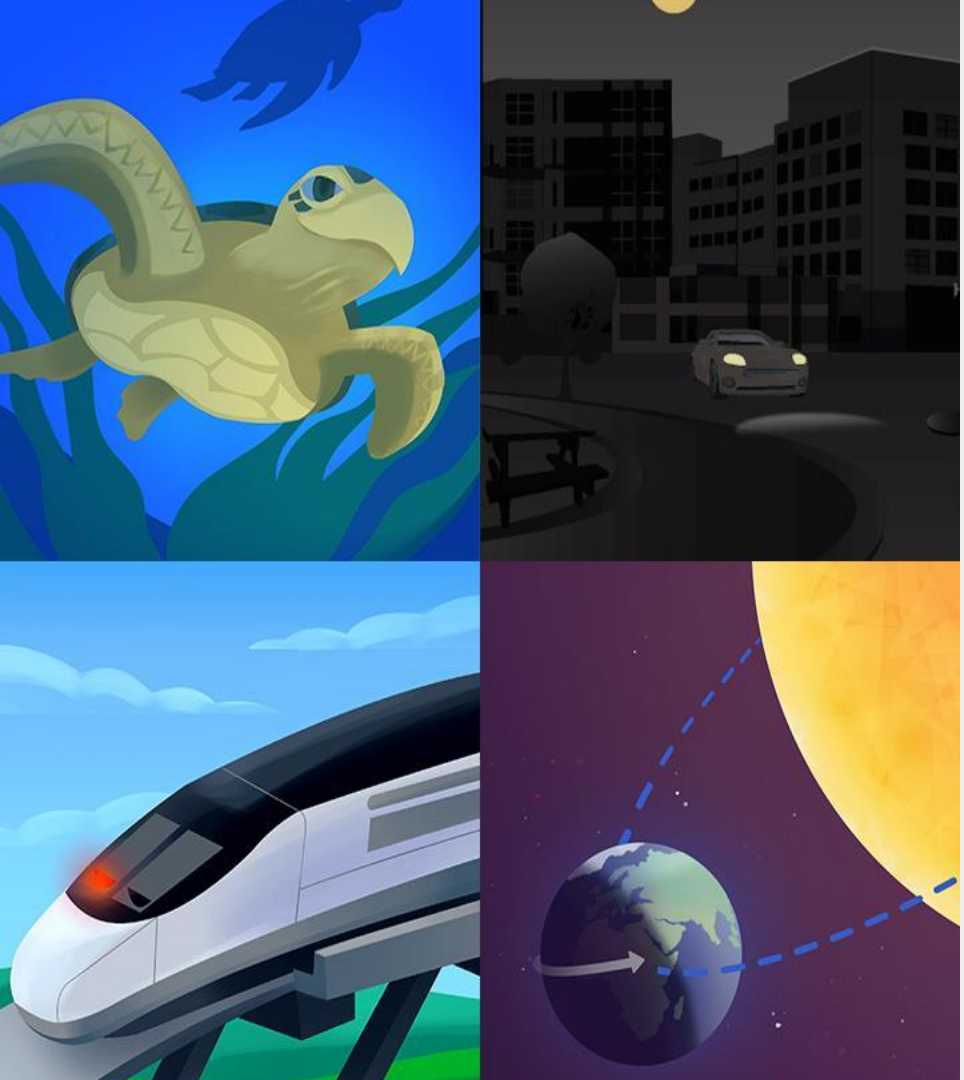


Reflection

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

Session goals and student outcomes

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



Plan for the day: Part 1

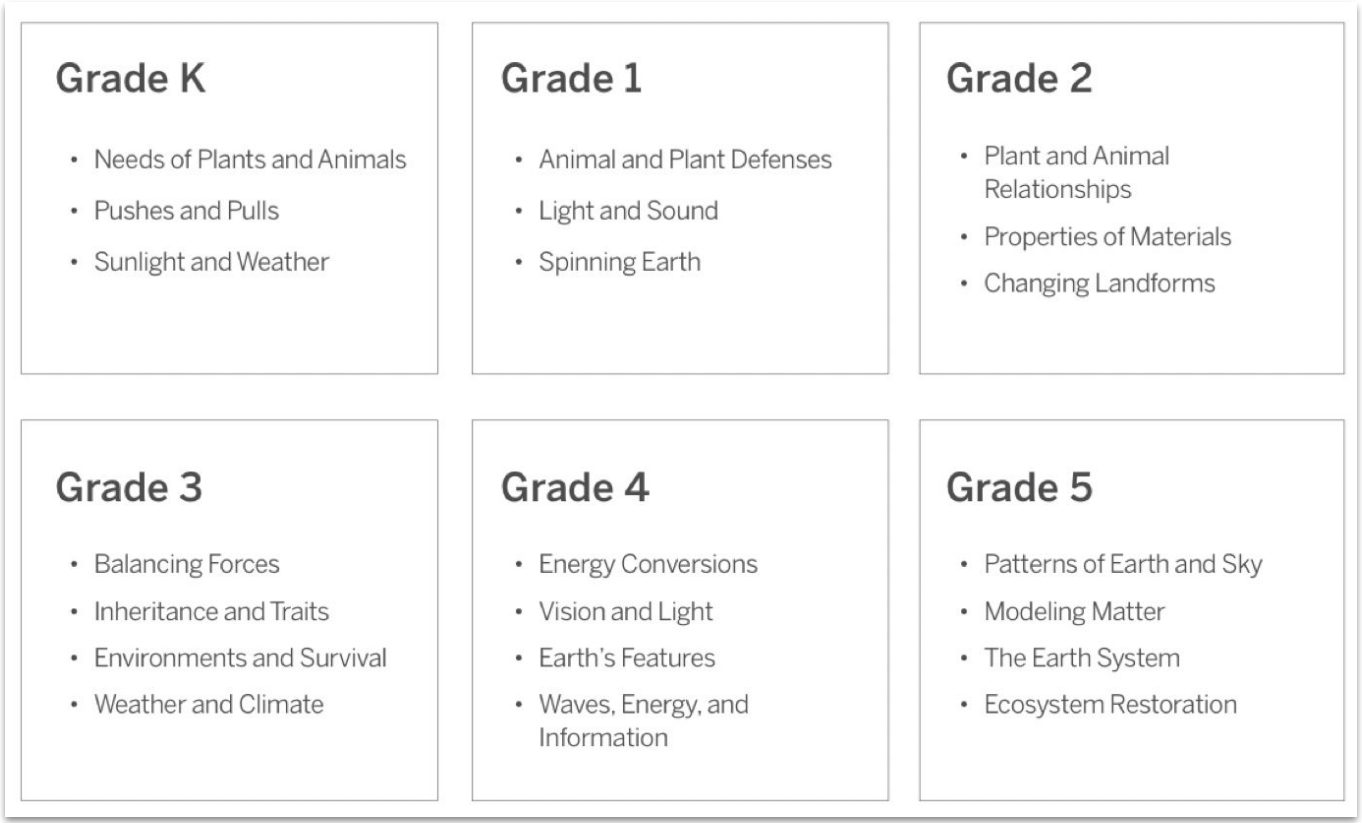
- Introduction and Framing
- NGSS & 3D Learning
- Phenomenon-based Instruction
- Unit Internalization
- Additional Resources
- Closing

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

+ Amplify.

Amplify Science

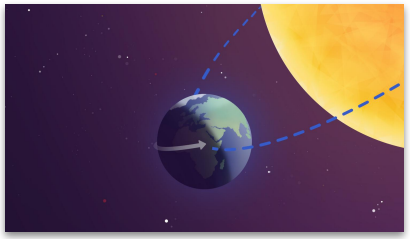
Course curriculum structure



Key takeaways:

- There are 22 lessons per unit
- Lessons at grades 2-5 are 60 minutes long

Year at a Glance: Grade 5

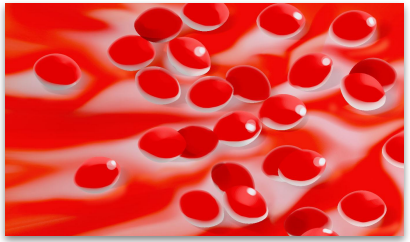


Patterns of Earth and Sky

Domain: Earth and Space Science

Unit type: Investigation

Student role: Astronomers

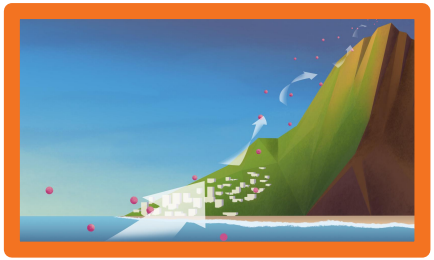


Modeling Matter

Domain: Physical Science

Unit type: Modeling

Student role: Food scientists



The Earth System

Domain: Earth and Space Science

Unit type: Engineering Design

Student role: Water resource engineers

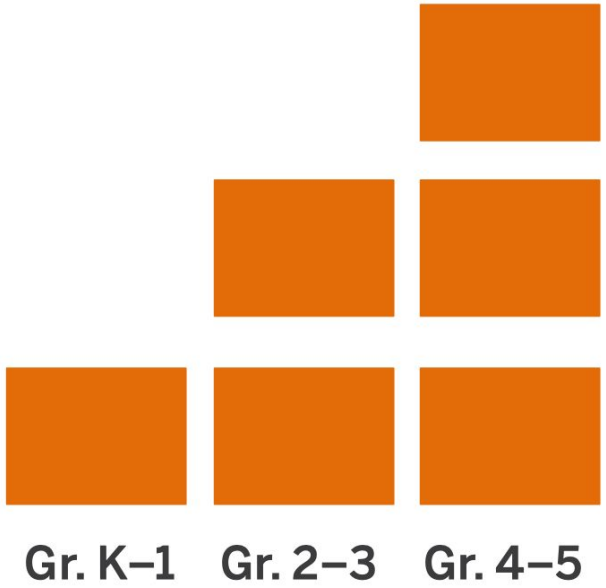
Ecosystem Restoration

Domain: Life Science

Unit type: Argumentation

Student role: Ecologists

What are the digital components of Amplify Science Elementary?



Student Simulations

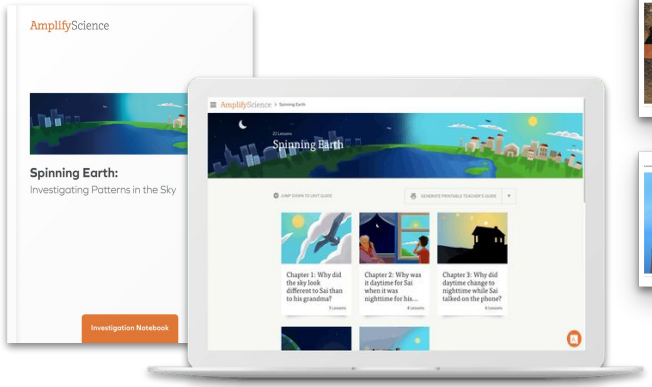
Student Science Practice Tools
(sorting tool, diagramming tool, modeling tool, data tool)

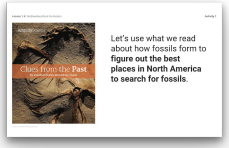
Teacher's Guide
(Online digital books for students)

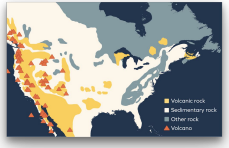
K-5 Program components

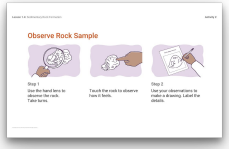
Teacher materials

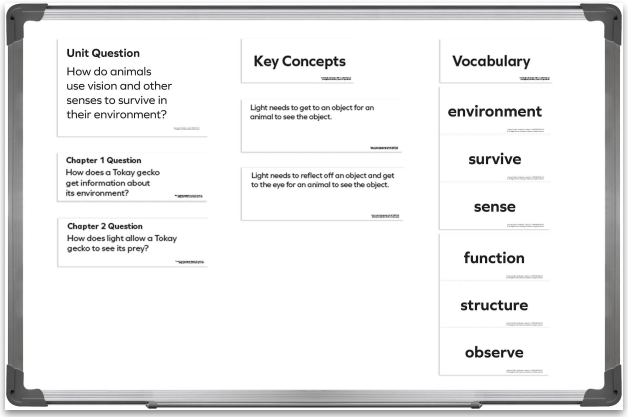
- Teacher's Guide (print and digital)
- Classroom Slides
- Classroom wall materials
- Embedded assessments
- Program Guide
- Program Hub
- Amplify Help Site







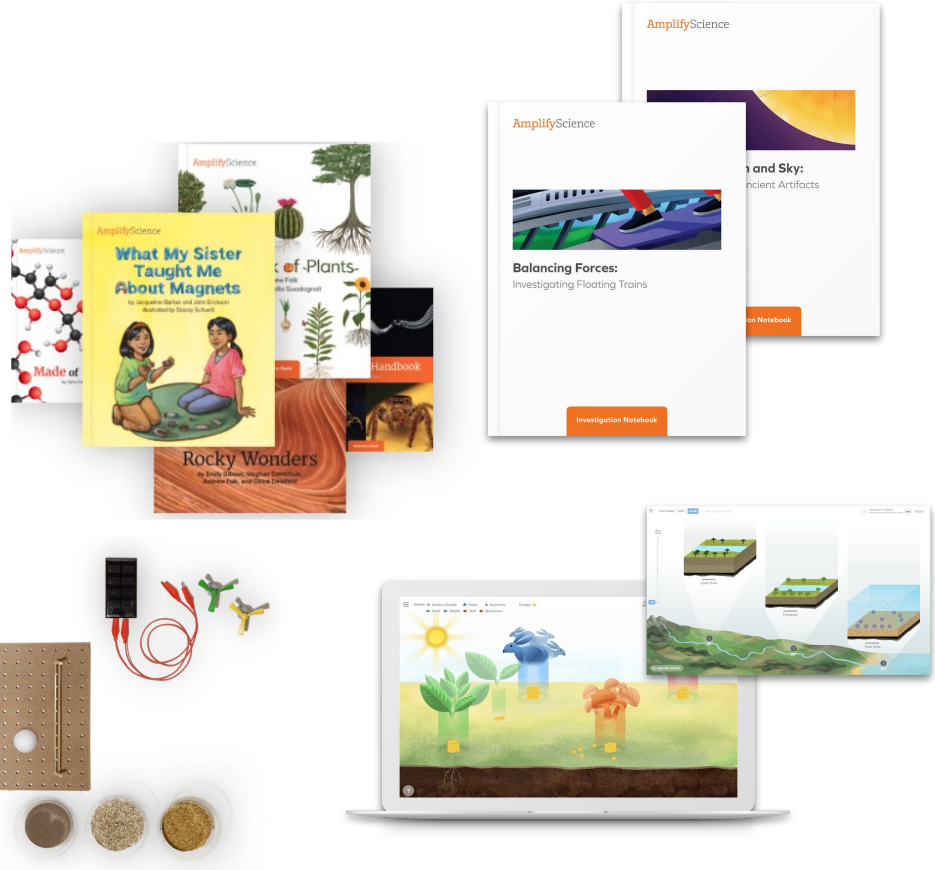




K-5 Program components

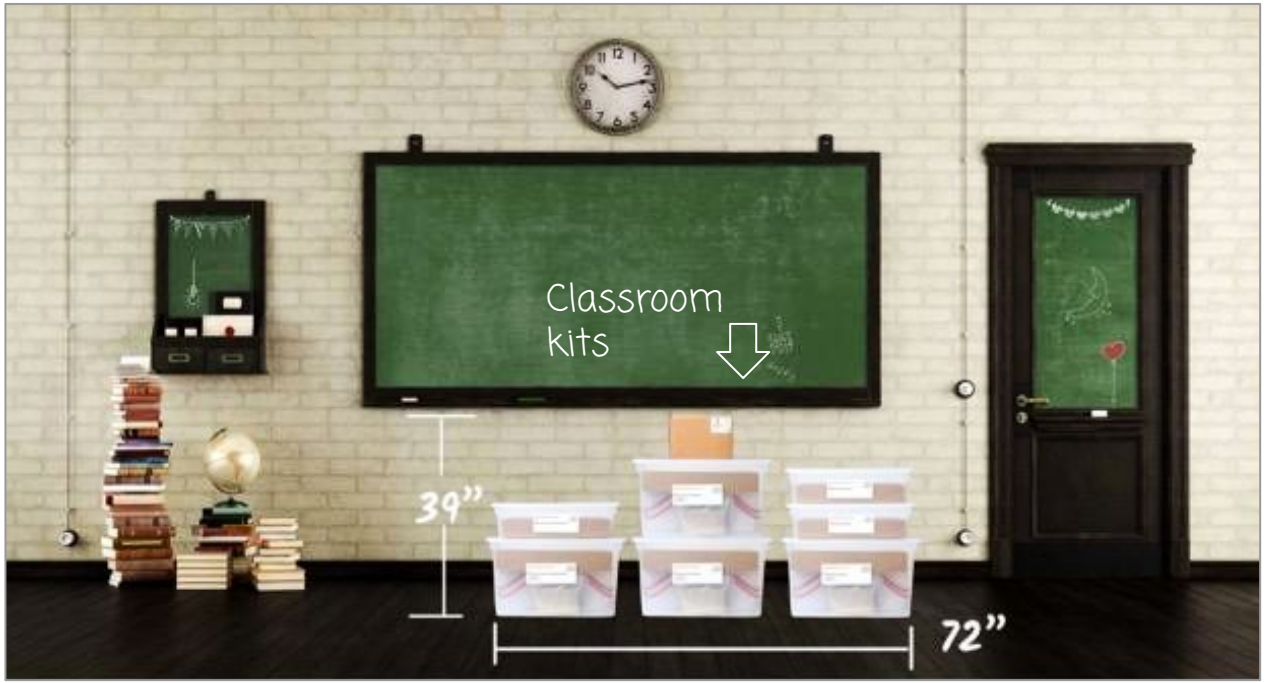
Student materials

- Hands-on materials
- Investigation Notebooks (print and digital)
- Student books
- Digital Applications



K-5 Program components

Classroom kits

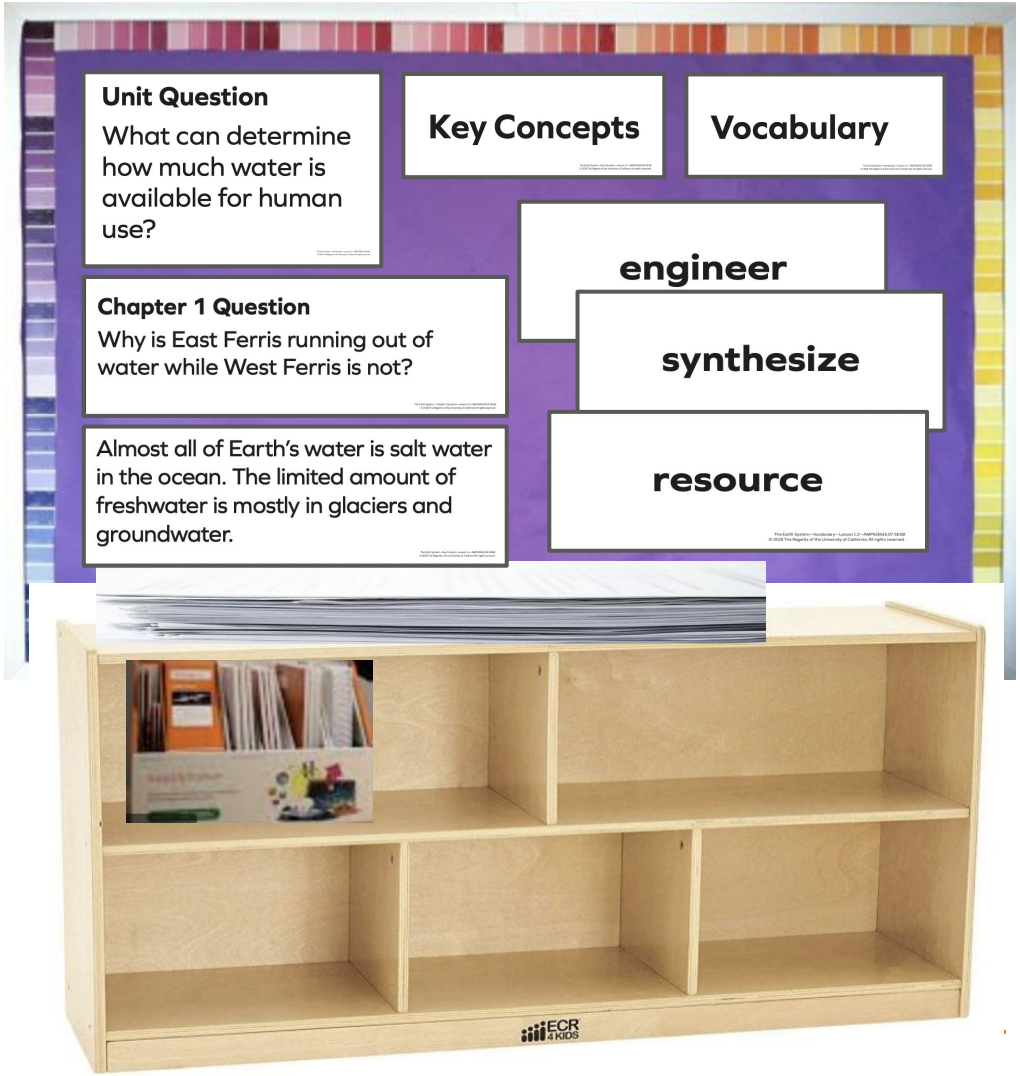


Classroom kits

Built for a class of 36 students, with consumables for two years

Unpacking the Kit

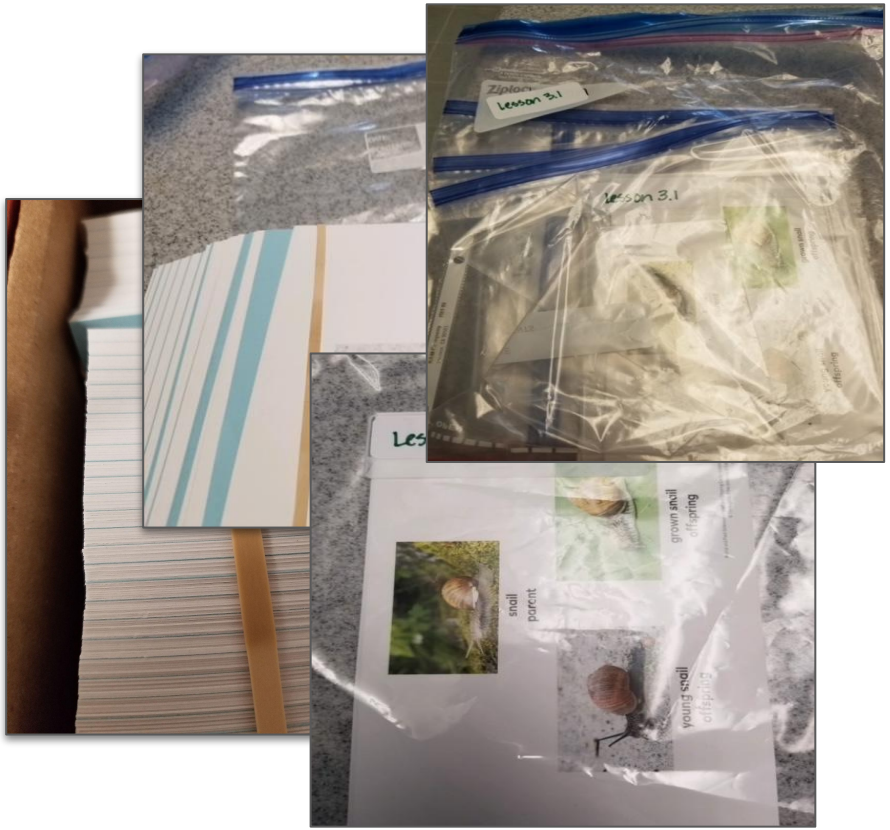
- Pull out the unit question, key concepts and vocabulary materials.
- Place them on the top of the table or bookcase below your science board
- Take books out of kit and place in the bookcase or on the table. (Always collect books after each lesson use. Return to bookcase so they are easily accessible.)



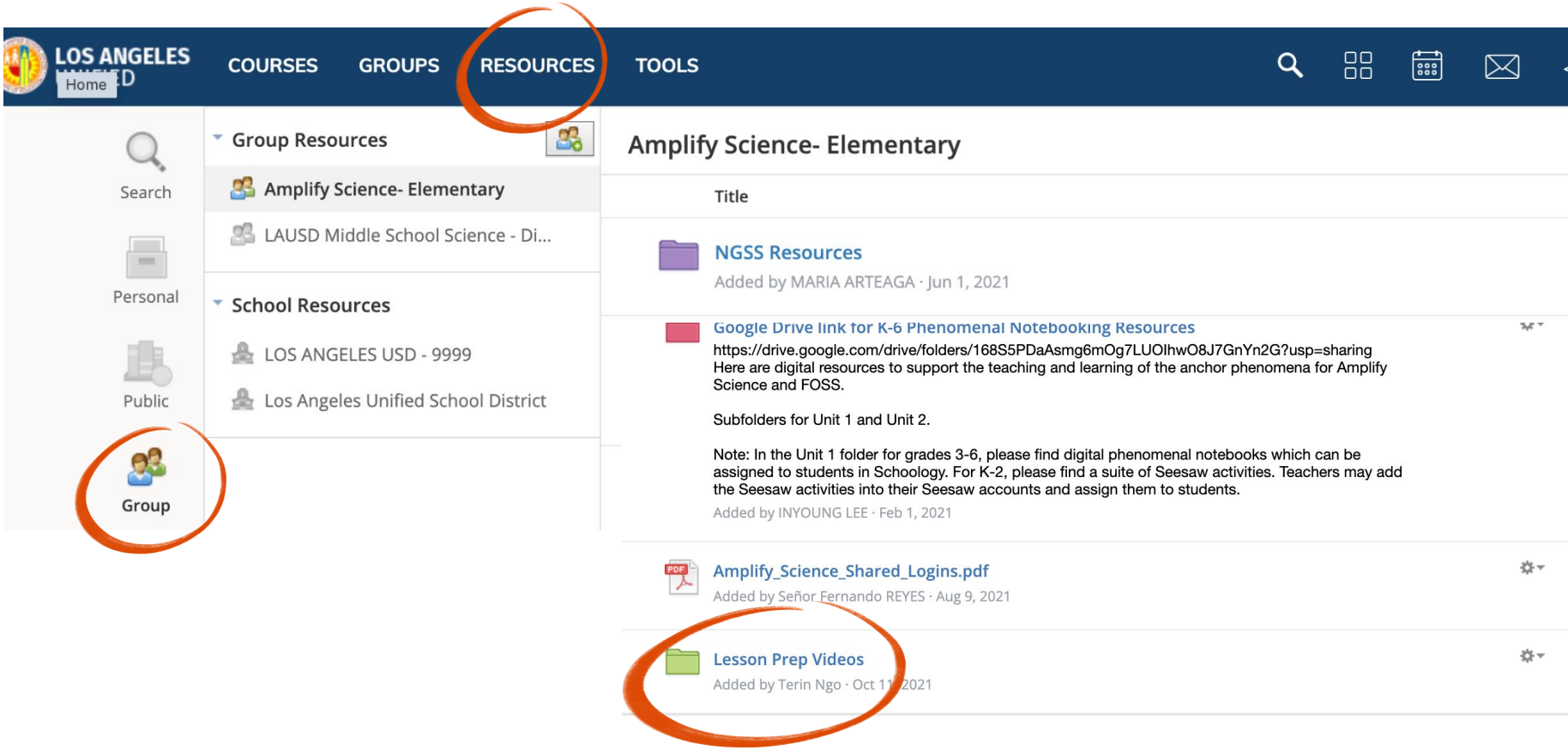
Cards for games, sorting or matching activities

Organization tips:

- Separate and place in envelopes or bags (or clip together)
- Label the envelopes or bags with the name and lesson # and activity # (ex. Lesson 2.4, Act. 1)
- Put each envelope or bag (1 set) into a bigger bag and label



LAUSD Schoology: Unit 1, 3-5 Lesson Prep Videos



LAUSD Microsite- https://amplify.com/laus

Welcome to Amplify Science!

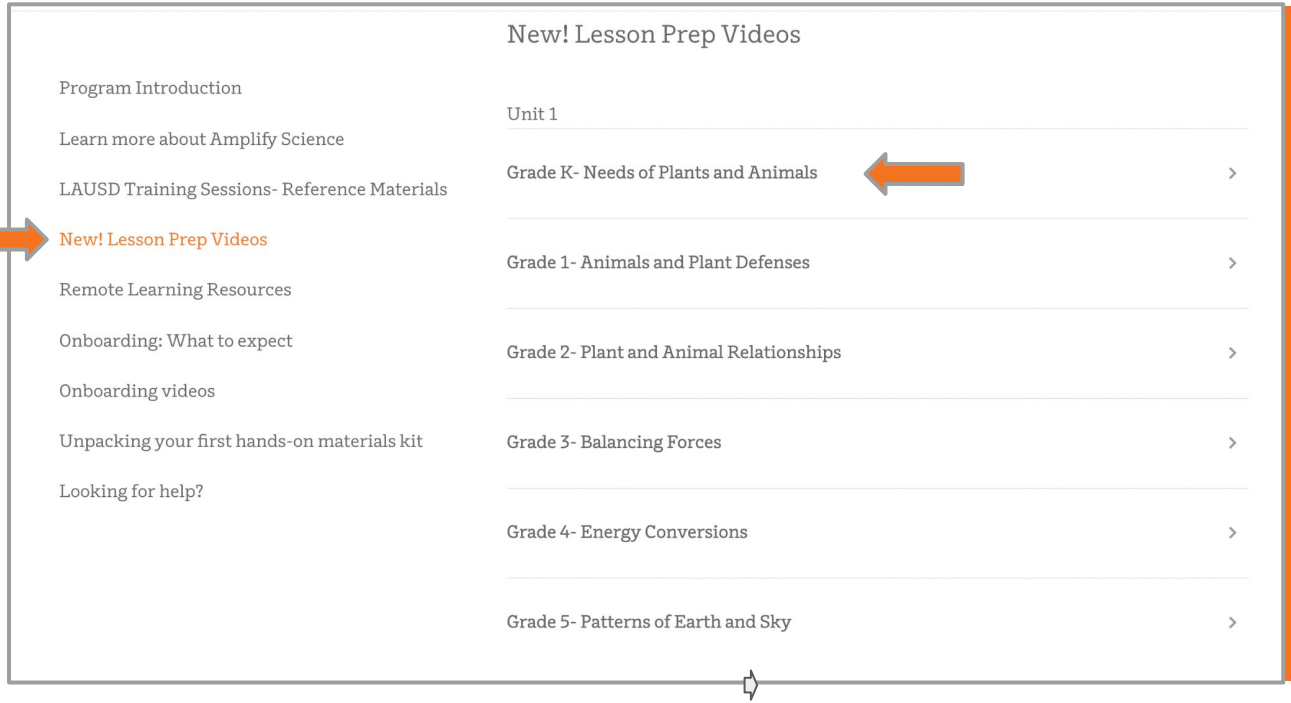
This site contains supporting resources designed for the LAUSD Amplify Science adoption for grades TK–8.

- Access the Amplify Science Program Hub (To help orient you to the new design, watch this video and view this reference guide.)
- Find out more about Amplify Science@Home
- Share the Caregiver Hub (Eng/Span) with your families
- For LAUSD ES Teachers- Amplify Science & Benchmark Advance Crosswalk
- Instructional guidance for a Responsive Relaunch of Amplify Science in 21-22

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

Microsite: Unit 1, K-2 Lesson Prep Videos

Classroom kits



Classroom Kits

Built for a class of 36 students, with consumables for two years

Hands On Material Organization

Directions

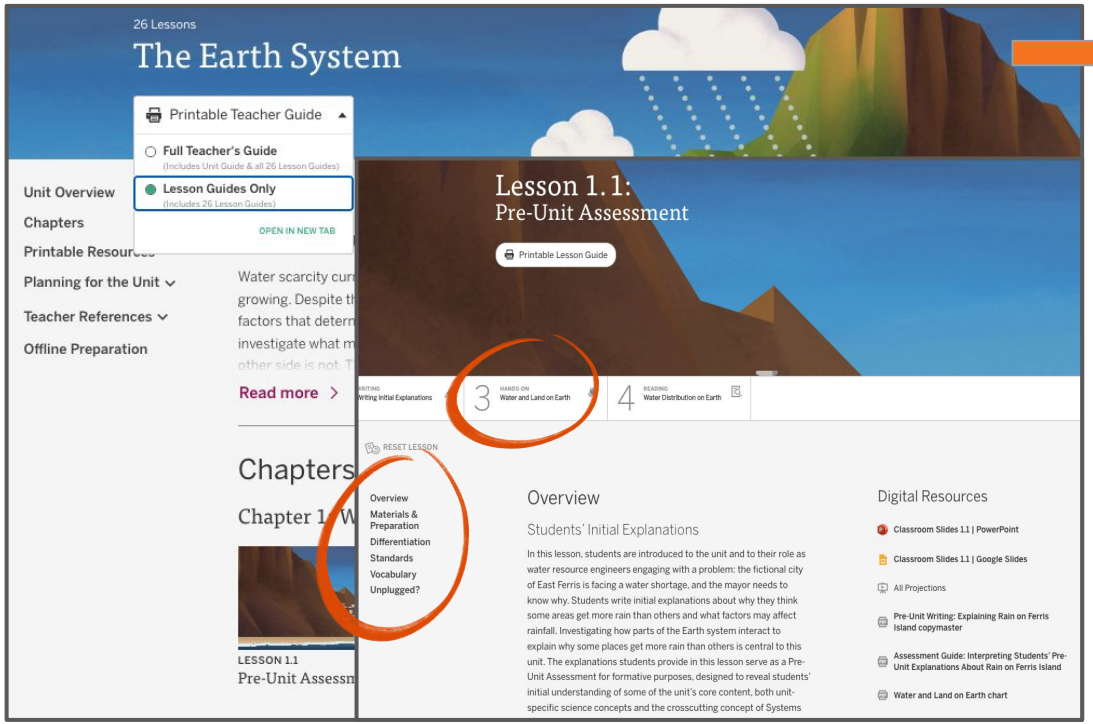
1. Open the Digital Lesson Guides Only page 7 from the Unit Landing page or go the Print TE to page 31. (Chapter 1 Activities)
2. Look for the lessons with Hands On.

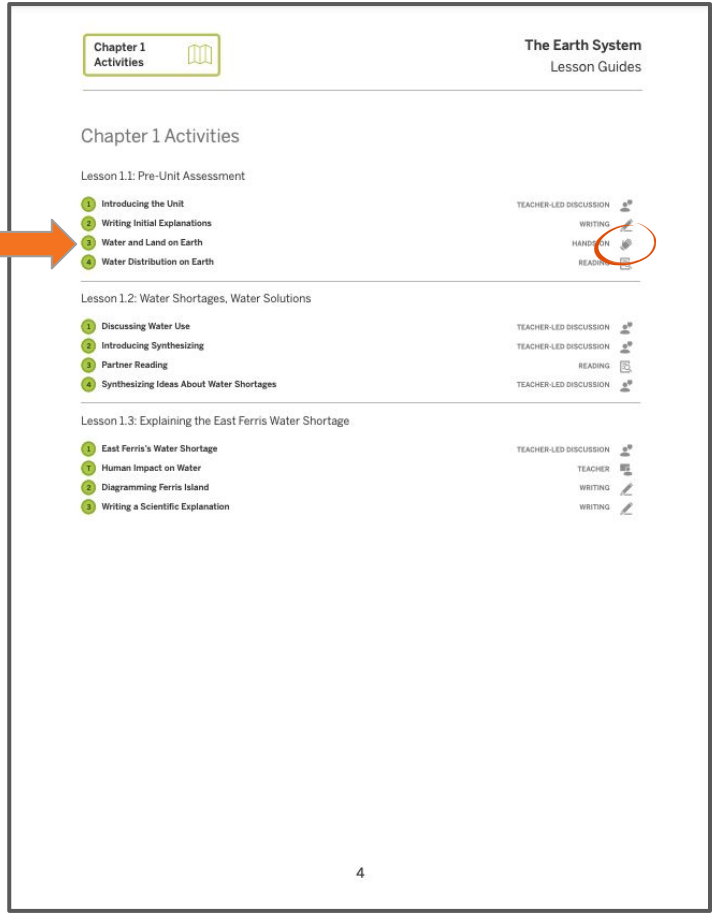
HANDS-ON

3. Note in the table below.
4. Review the materials and preparation to determine if it can be prepared prior to the lesson or on the day of the lesson.
5. Use this same procedure for each Chapter. (Go to the Chapter Activities Contents)

Chapter/Lesson	Activity	Prep Prior	Prep Day of	What to do	
1.1	1	X		Prep plastic bags with labels A, B, C, D and M. Place 1 tsp of the following cinnamon, salt, flour, cornstarch in A,B,C, D. In bag M mix 1 tsp salt and 1 tsp cinnamon.	*This is an example from Properties of Materials Grade 2*

- Open Your **Lesson Guides Only**
- Start with **Chapter 1** and look for the **hands icon**
- Go into the lesson **materials and prep**





Hands On Material Organization

Completed for The Earth System

G5 The Earth System

Directions

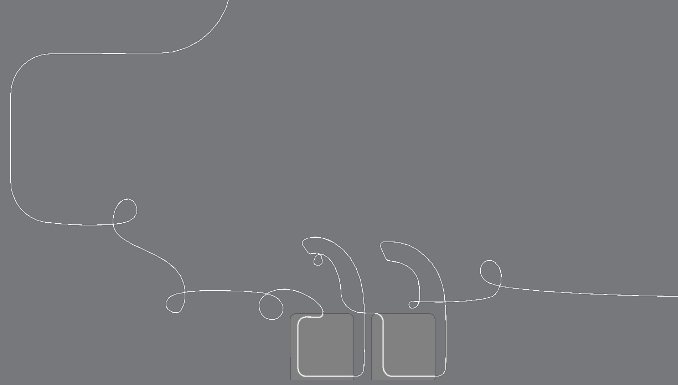
1. Open the Digital Lesson Guides Only page 7 from the Unit Landing page or go the Print TE to page 31. (Chapter 1 Activities)
2. Look for the lessons with Hands On.

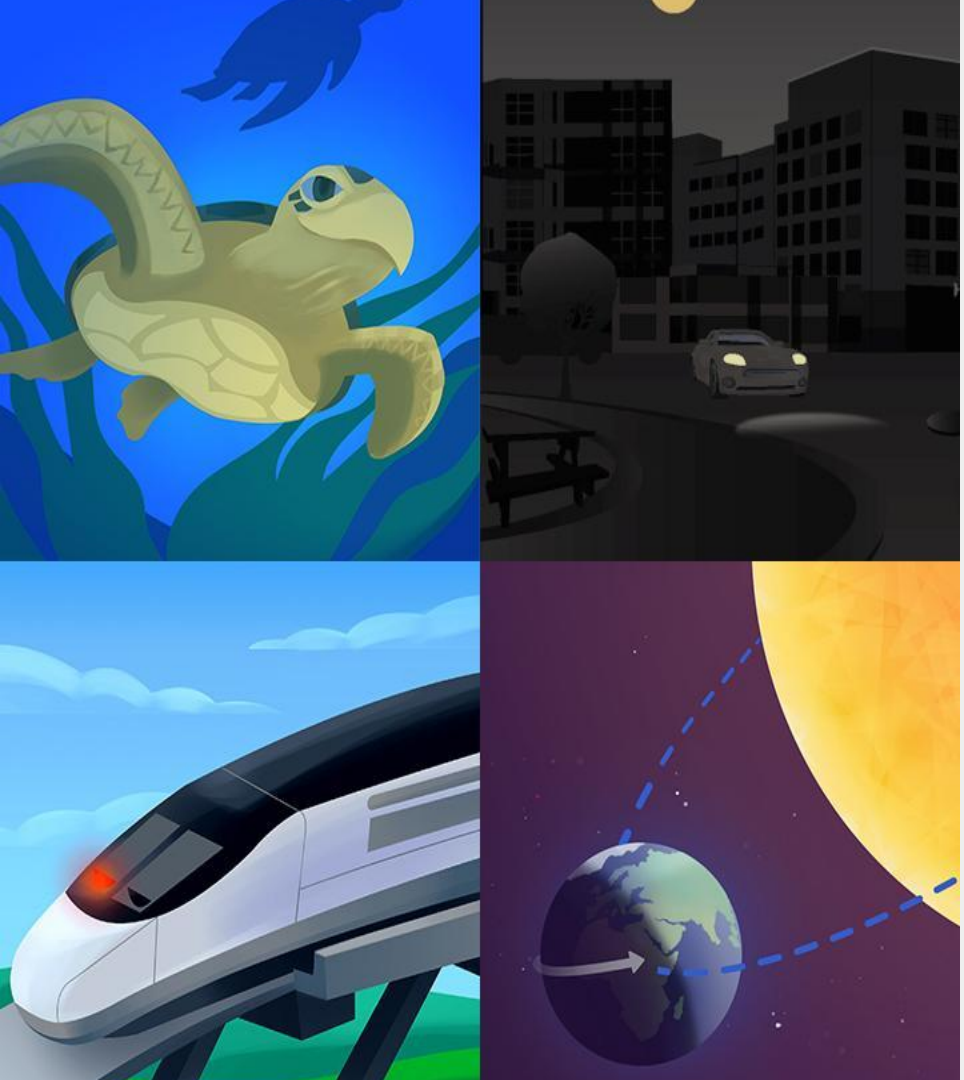
HANDS-ON

3. Note in the table below.
4. Review the materials and preparation to determine if it can be prepared prior to the lesson or on the day of the lesson.
5. Use this same procedure for each Chapter. (Go to the Chapter Activities Contents)

Chapter/Lesson	Activity	Prep Prior	Prep Day of	What to do
1.1	3	X		**Inflate the globe. Create the Water and Land on Earth chart**. On the board, create the Water and Land on Earth chart. (https://learning.amplify.com/m/543affd45659607a/original/ELSCI_5-ESB-C_CU_110.pdf) During Activity 3, you will fill in the chart with tally marks in the appropriate column each time the globe is tossed. **Create the Partner Reading Guidelines.** On a sheet of chart paper, create these guidelines. (https://learning.amplify.com/m/721d20f1d394fb61/original/SCI_PartnerReadingGuidelines.pdf) You will keep this posted throughout the unit. If you don't have enough wall space, you can take it down and repost it during the reading lessons. Create the Our Experiences and What We Think We Know charts. Title one piece of chart paper "Our Experiences" and another piece of chart paper "What We Think We Know." Leave the rest of each sheet blank to add student responses. You will reference these charts during the unit as students make connections to their prior knowledge and experiences, so find a place where you can keep it posted. If you don't have enough wall space, you will need to take it down and post it during the lessons in which you reference it.
2.1	2/3	X	X	**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. **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.
2.2	1	X	X	**Deflate the globe.** If your globe is fully inflated from Lesson 1.1, deflate it so that you can demonstrate blowing it up during Activity 2. **Review Activity 1**. For this activity, you will need to prepare materials for Where the Water Drops Come From: Investigation 2. Read this Preparation section carefully and review the activity to familiarize yourself with what needs to be done before the day of the class, immediately before the lesson, and during the activities. Prepare ice cubes. In Activity 1, each pair of students will need about six ice cubes. Prepare or obtain enough ice for each Store them in a freezer until immediately before the lesson. **Just before the lesson:** Prepare materials for Activity 1. Groups of four students will share a tray of materials, but students will work in pairs during Where the Water Drops Come From: Investigation 2. On each plastic tray, place two hand lenses, four plastic cups, and two plastic bags. Using a pitcher of water, fill each plastic cup halfway with water. You will also need one additional plastic cup to add ice to each pair's cup of water. Set one cup aside for your use. Transfer materials from the freezer to a cooler. If you do not have a freezer near your classroom, transfer the ice cubes from the freezer to a cooler so that they stay cold until you are ready to use them during the lesson.

Questions?





Plan for the day: Part 1

- Introduction and Framing
- NGSS & 3D Learning
- Phenomenon-based Instruction
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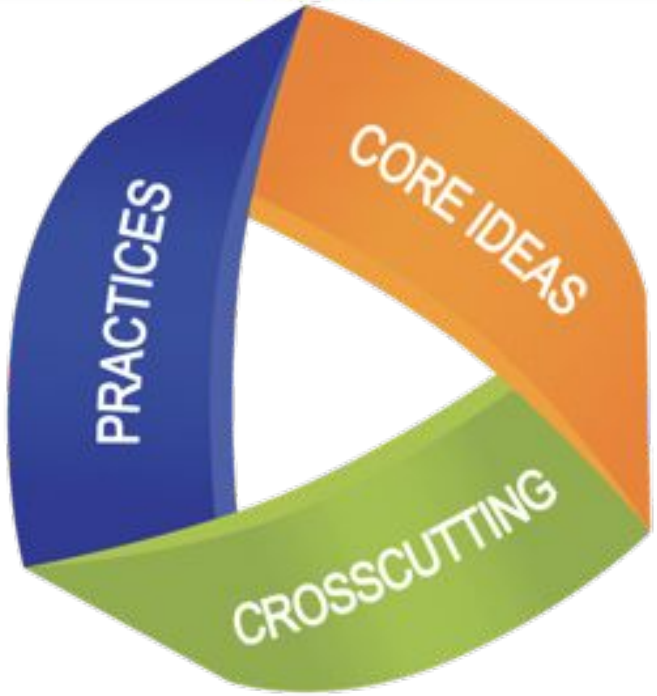
Next Generation Science Standards

Three dimensional learning

Evaluate your knowledge

- On a scale of 0-5, how would you rate your familiarity with 3-D learning?



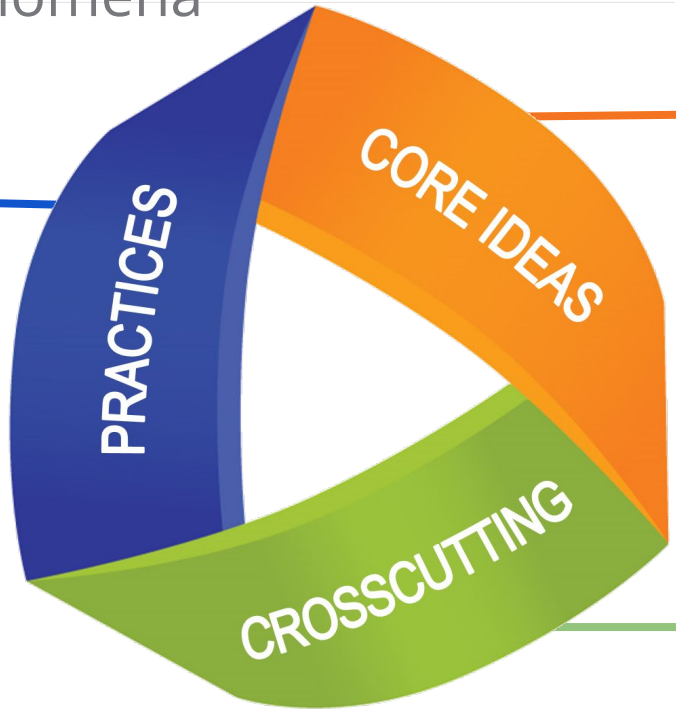
Conceptual Shifts in NGSS

1. K-12 Science Education Should Reflect the Interconnected Nature of Science as it is Practiced and Experienced in the Real World.
2. The Next Generation Science Standards are student performance expectations – NOT curriculum.
3. The science concepts in the NGSS build coherently from K-12.
4. The NGSS Focus on Deeper Understanding of Content as well as Application of Content.
5. Science and Engineering are Integrated in the NGSS from K–12.
6. The NGSS are designed to prepare students for college, career, and citizenship.
7. The NGSS and Common Core State Standards (Mathematics and English Language Arts) are Aligned.

Using 3-D teaching and learning

for figuring out phenomena

What scientists do
Science and Engineering Practices



What scientists want to know
Disciplinary Core Ideas

How scientists think
Crosscutting Concepts

Three dimensions of NGSS (CA) at a glance

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
SEP-1. Asking questions and defining problems SEP-2. Developing and using models SEP-3. Planning and carrying out investigations SEP-4. Analyzing and interpreting data SEP-5. Using mathematics and computational thinking SEP-6. Constructing explanations (for science) and designing solutions (for engineering) SEP-7. Engaging in argument from evidence SEP-8. Obtaining, evaluating, and communicating information	**Physical Science** PS1: Matter and its interactions PS2: Motion and stability: Forces and interactions PS3: Energy PS4: Waves and their applications in technologies for information transfer **Life Science** LS1: From molecules to organisms: Structures and processes LS2: Ecosystems: Interactions energy, and dynamics LS3: Heredity: Inheritance and variation of traits LS4: Biological evolution: Unity and diversity **Earth and Space Science** ESS1: Earth's place in the universe ESS2: Earth's systems ESS3: Earth and human activity **Engineering, Technology, and Applications of Science** ETS1: Engineering Design ETS2: Links among engineering, technology, science, and society	CCC-1. Patterns CCC-2. Cause and effect: Mechanism and explanation CCC-3. Scale, proportion, and quantity CCC-4. Systems and system models CCC-5. Energy and matter: Flows, cycles, and conservation CCC-6. Structure and function CCC-7. Stability and Change

An Analogy between NGSS and a Cake

Baking a cake
(performance expectations)

Baking Tools and Techniques (Science & Engineering Practices)

Science and Engineering Practices

inquiry

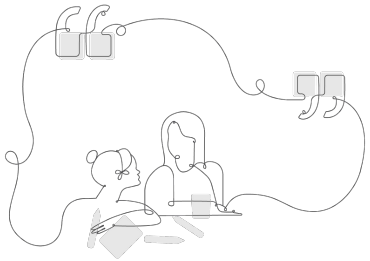
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data

math

5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)

language

7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information



An Analogy between NGSS and a Cake

Baking a cake
(performance expectations)

Baking Tools and Techniques (Science & Engineering Practices)

Cake (Disciplinary Core Ideas)

Disciplinary Core Ideas

Pg. 7,8

Life Science	Physical Science
LS1: From Molecules to Organisms: Structures and Processes LS2: Ecosystems: Interactions, Energy, and Dynamics LS3: Heredity: Inheritance and Variation of Traits LS4: Biological Evolution: Unity and Diversity	PS1: Matter and Its Interactions PS2: Motion and Stability: Forces and Interactions PS3: Energy PS4: Waves and Their Applications in Technologies for Information Transfer
Earth & Space Science	**Engineering & Technology**
ESS1: Earth's Place in the Universe ESS2: Earth's Systems ESS3: Earth and Human Activity	ETS1: Engineering Design ETS2: Links Among Engineering, Technology, Science, and Society

An Analogy between NGSS and a Cake

Baking a cake
(performance expectations)

Baking Tools and Techniques (Science & Engineering Practices)

Cake (Disciplinary Core Ideas)

Frosting (Crosscutting Concepts)

Crosscutting Concepts

5. Energy and Matter

Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

6. Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

7. Stability and Change

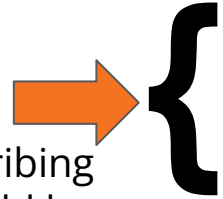
For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

4. Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

NGSS Standards, Grade 5

What is Assessed
a collection of **performance expectations** describing what students should be able to do to master the standard



5-ESS3 Earth and Human Activity

5-ESS3 Earth and Human Activity

Students who demonstrate understanding can:

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. ▪ Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)	**ESS3.C: Human Impacts on Earth Systems** ▪ Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)	**Systems and System Models** ▪ A system can be described in terms of its components and their interactions. (5-ESS3-1) --- ***Connections to Nature of Science*** **Science Addresses Questions About the Natural and Material World.** ▪ Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)

Connections to other DCIs in fifth grade: N/A

Articulation of DCIs across grade-levels: **MS.ESS3.A** (5-ESS3-1); **MS.ESS3.C** (5-ESS3-1); **MS.ESS3.D** (5-ESS3-1)

Common Core State Standards Connections:

ELA/Literacy –

RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. *(5-ESS3-1)*

RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.(5-ESS3-1)

RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS3-1)

W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS3-1)

W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. *(5-ESS3-1)*

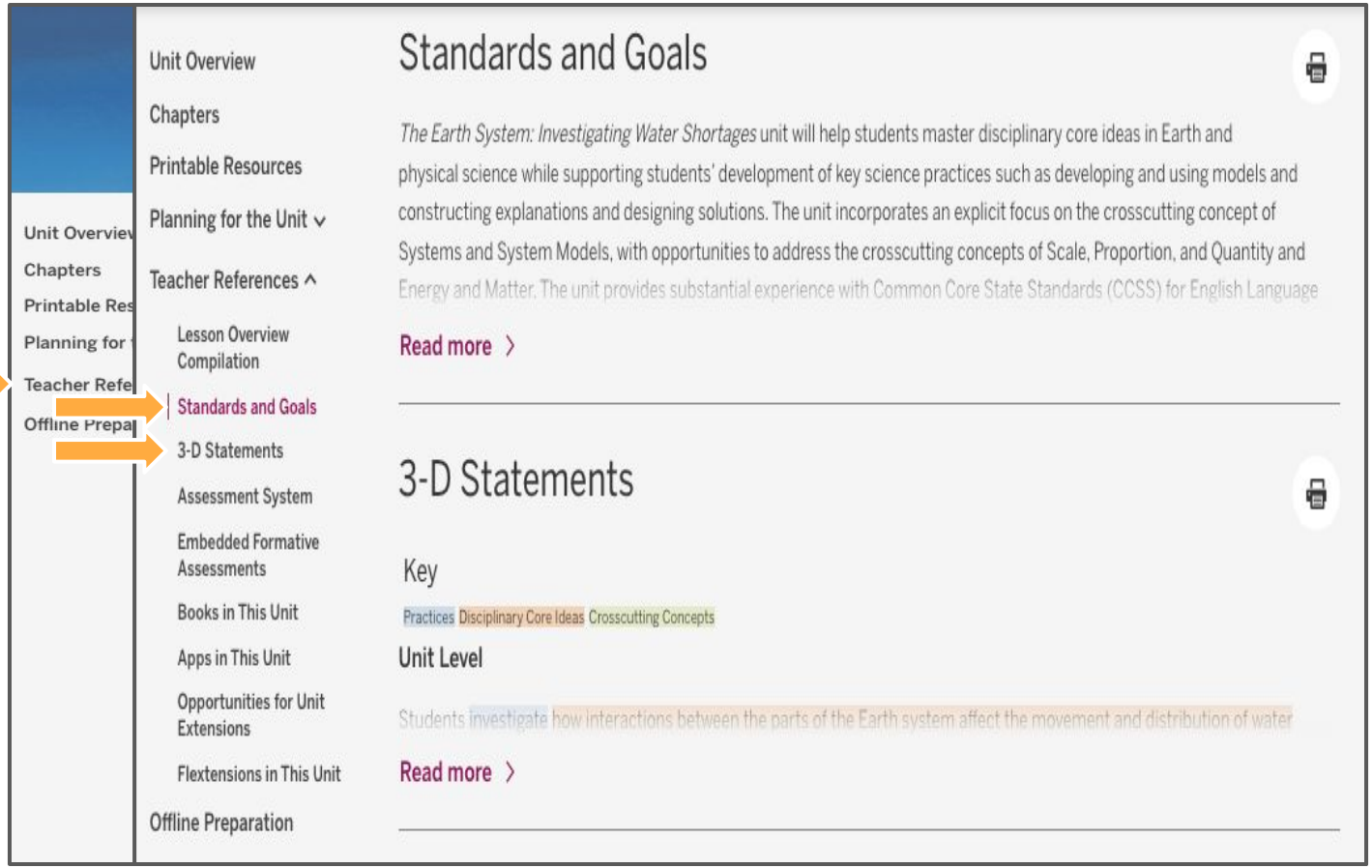
Mathematics –

MP.2 Reason abstractly and quantitatively. *(5-ESS3-1)*

MP.4 Model with mathematics. *(5-ESS3-1)*

Navigate to the Unit Landing Page

Review the **Standard and Goals** and the **3-D Statements**



The Earth System: 3D Statements

Key

Practices Disciplinary Core Ideas Crosscutting Concepts

Unit Level

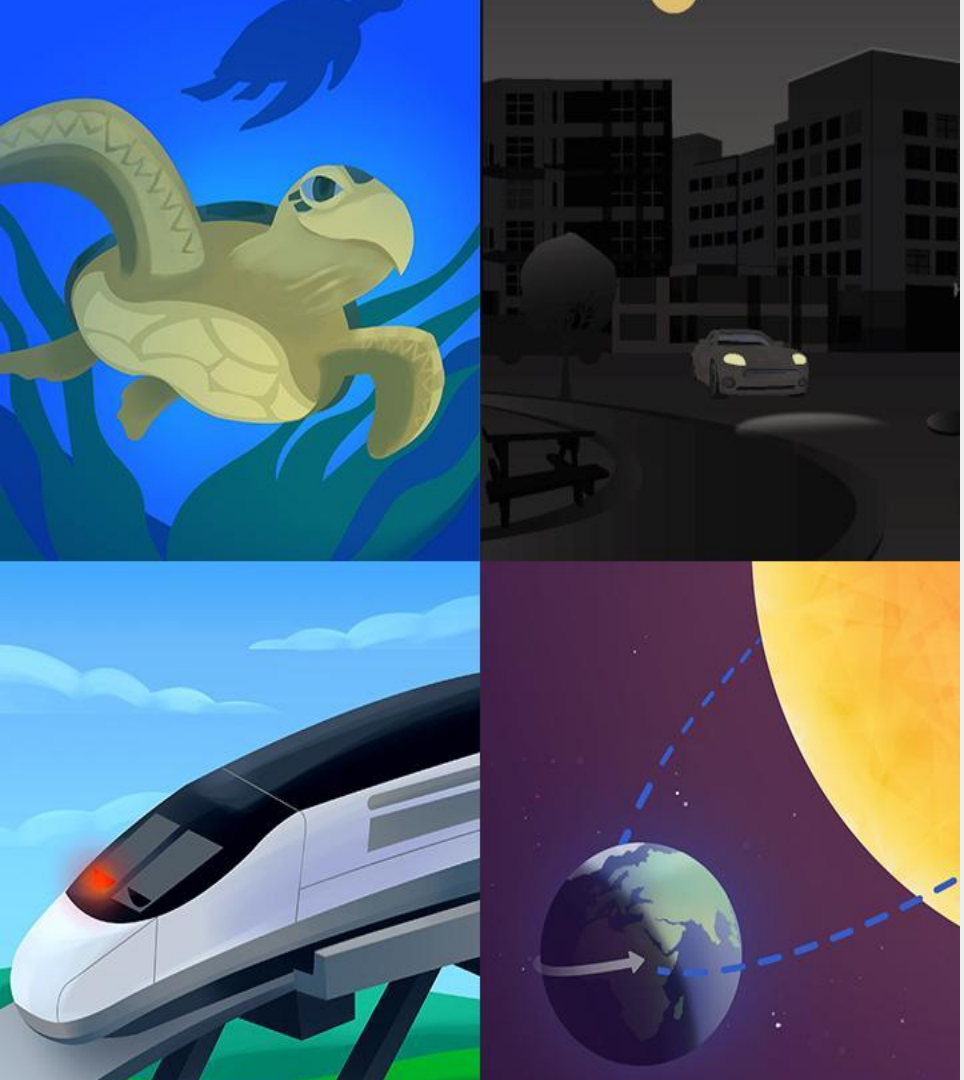
Students investigate how interactions between the parts of the Earth system affect the movement and distribution of water (systems and system models), and they apply their understanding to design solutions for a water shortage. Students also obtain information from firsthand investigations, models, and text to figure out how new substances can form through chemical reactions, even though no matter is created or destroyed (energy and matter).

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

Students work to define the problem by analyzing the fresh water shortage in East Ferris and discussing the water shortage as interactions of the Earth's biosphere and hydrosphere (systems and system models).

Lesson 1.2: Water Shortages, Water Solutions

Students read the book *Water Shortages, Water Solutions* to obtain and evaluate information regarding how the actions of humans can change the availability of freshwater in a region (stability and change) in order to better define the problem of water availability in East Ferris.



Plan for the day: Part 1

- Introduction and Framing
- NGSS & 3D Learning
- Phenomenon-based Instruction
- Unit Internalization
- Additional Resources
- Closing

Next Generation Science Standards

Phenomenon-based learning and teaching

A scientific phenomenon is an **observable event** that occurs in the universe that we can use science ideas to explain or predict.

Comparing topics and phenomena

Topic-based	Phenomenon-based
Chemical reactions	There's a reddish-brown substance in a town's tap water.

Next Generation Science Standards

How might learning be different?

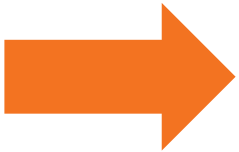
Topic-based	Phenomenon-based
Chemical reactions	There's a reddish-brown substance in a town's tap water.
Electric circuits	A flashlight won't turn on, even though it used to work.
Natural selection	A population of newts has become more poisonous over time.

Comparing topics and phenomena

A shift in science instruction

from learning about

(like a student)



to figuring out

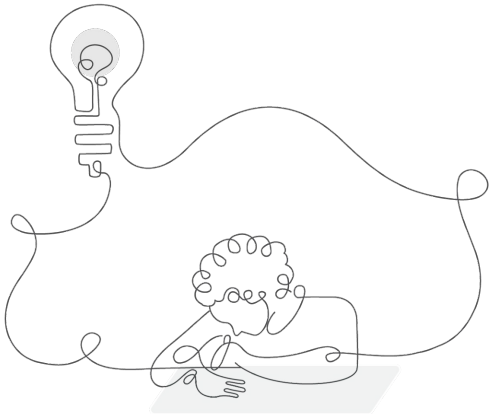
(like a scientist)

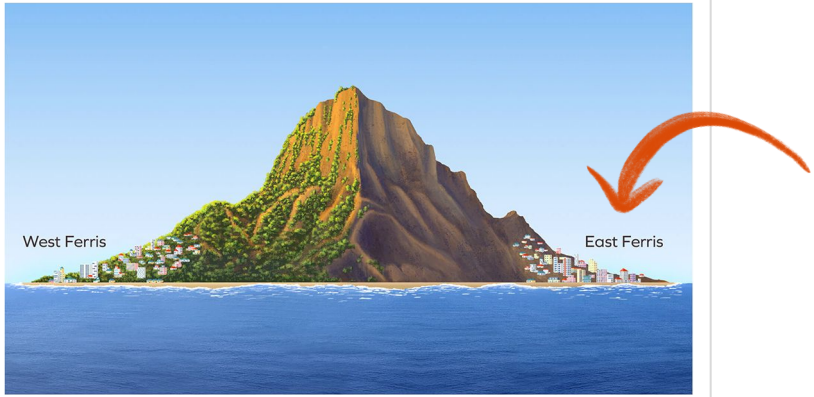
Previewing the unit

Introducing the 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.

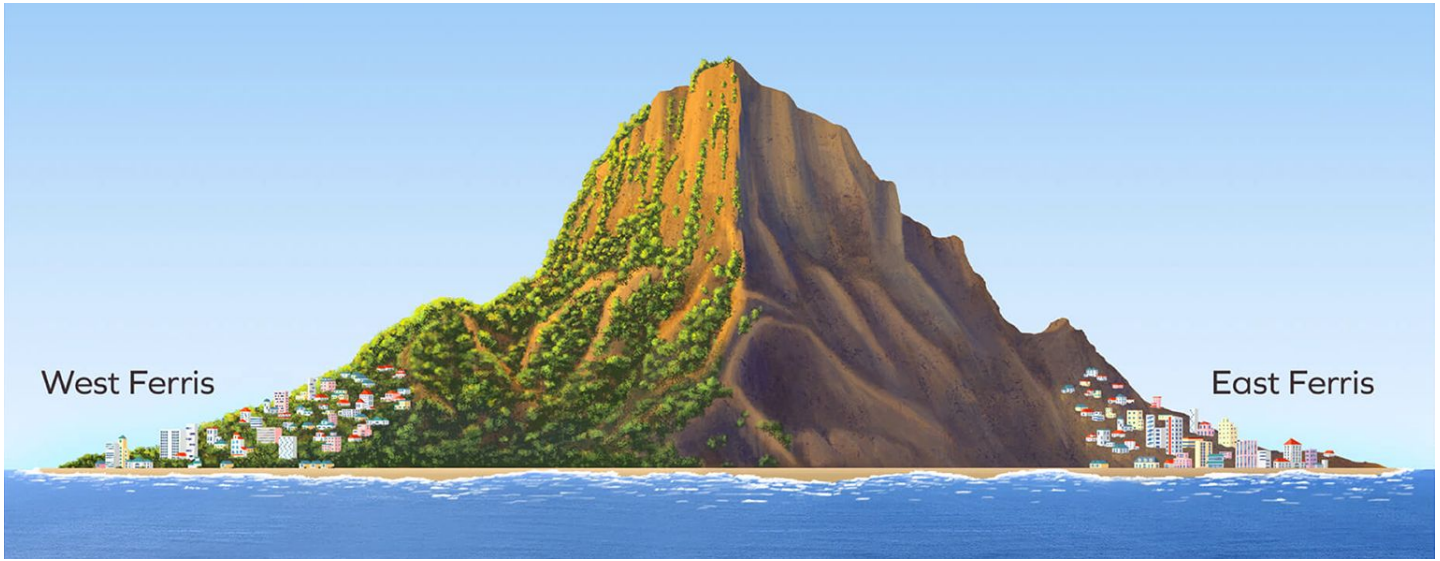




We are beginning a unit about **water.**

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

What do you notice about Ferris Island?



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

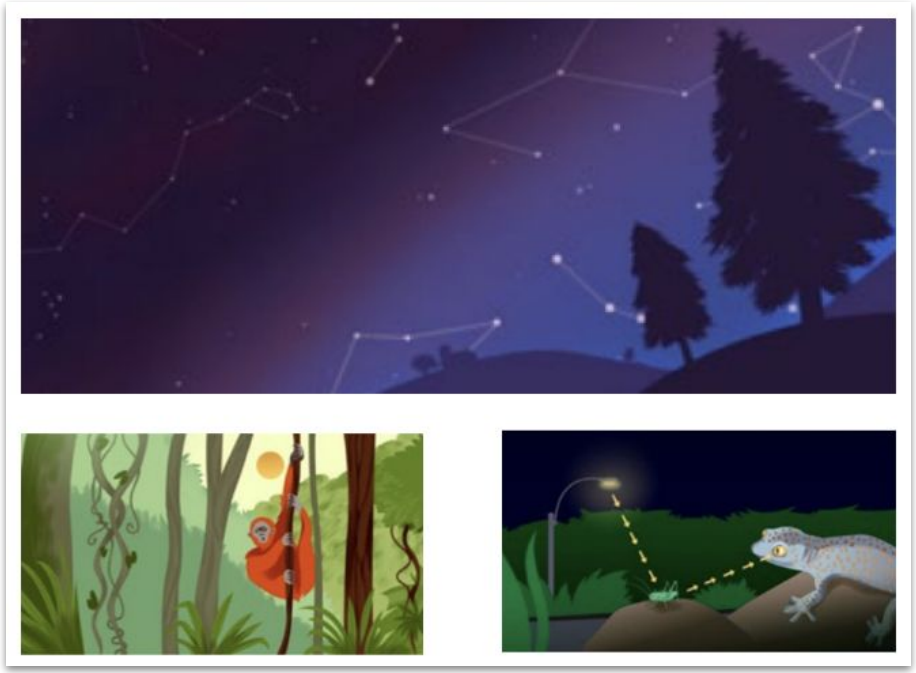
To: Water Resource Engineers
From: Mayor McKnight, East Ferris City Hall
Subject: Water Shortage in East Ferris

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.

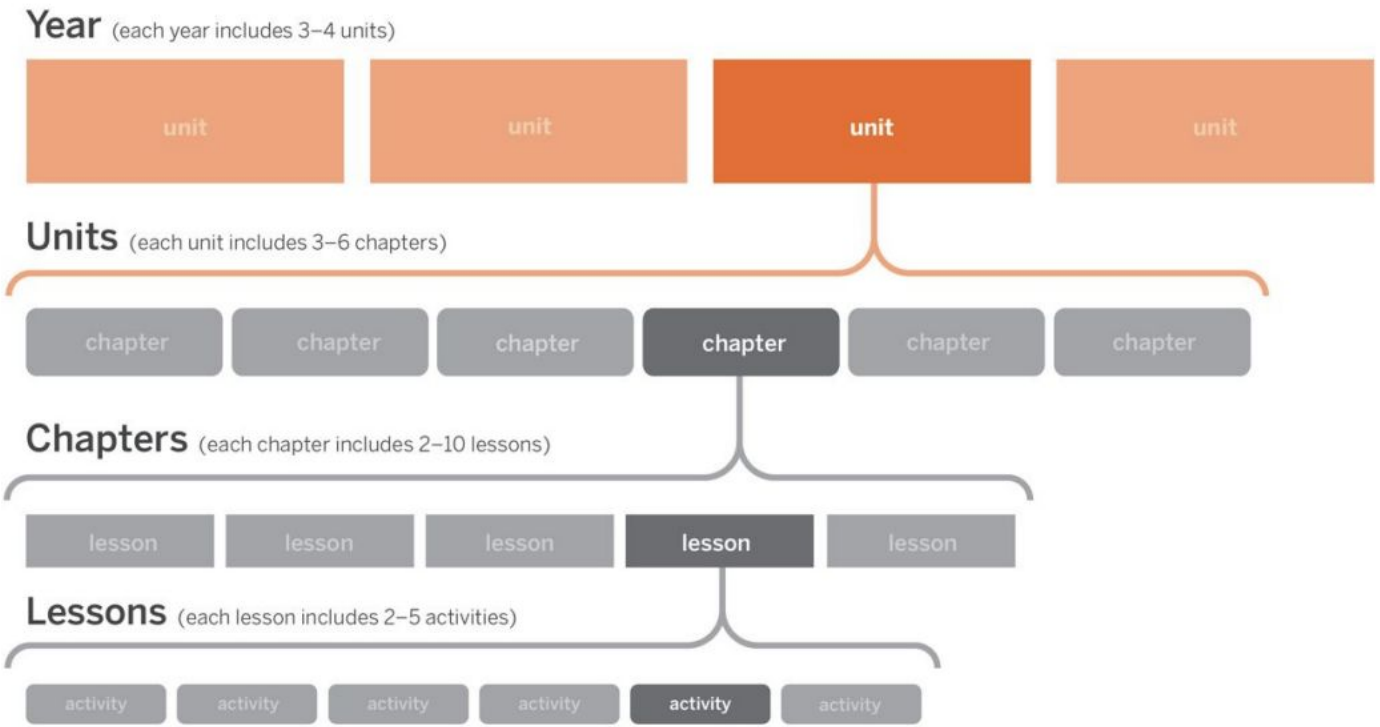
Amplify Science

Anchoring phenomenon

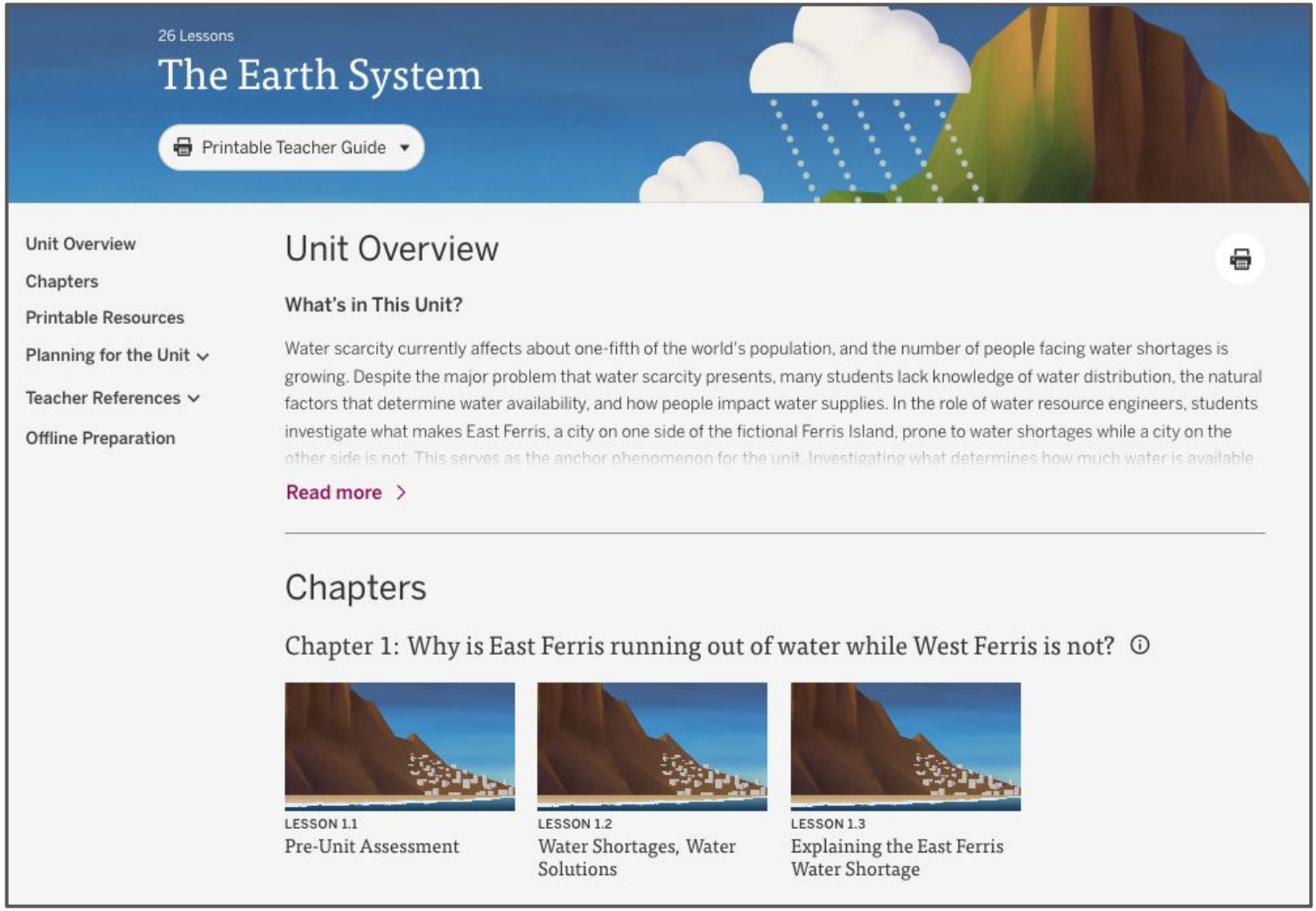
- Complex and rich
- Drives learning through a whole unit
- Specific and observable
- Relatable at students' developmental level



K-5 Navigation structure



Let's Go Live!

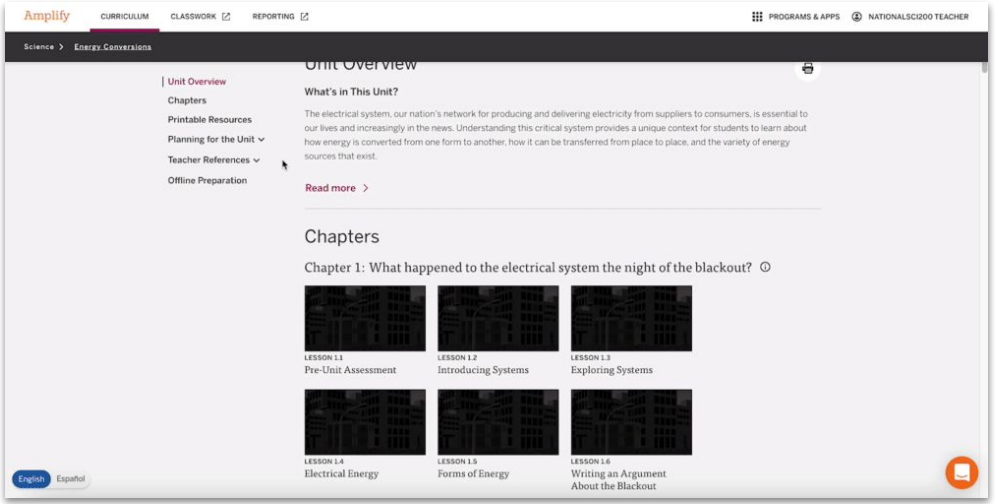

26 Lessons
The Earth System
Printable Teacher Guide
Unit Overview
Chapters
Printable Resources
Planning for the Unit
Teacher References
Offline Preparation
Unit Overview
What's in This Unit?
Water scarcity currently affects about one-fifth of the world's population, and the number of people facing water shortages is growing. Despite the major problem that water scarcity presents, many students lack knowledge of water distribution, the natural factors that determine water availability, and how people impact water supplies. In the role of water resource engineers, students investigate what makes East Ferris, a city on one side of the fictional Ferris Island, prone to water shortages while a city on the other side is not. This serves as the anchor phenomenon for the unit. Investigating what determines how much water is available
Read more
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

Unit Level resources

Pg. 11-13

Collection of resources to support planning and day-to-day instruction in the unit:

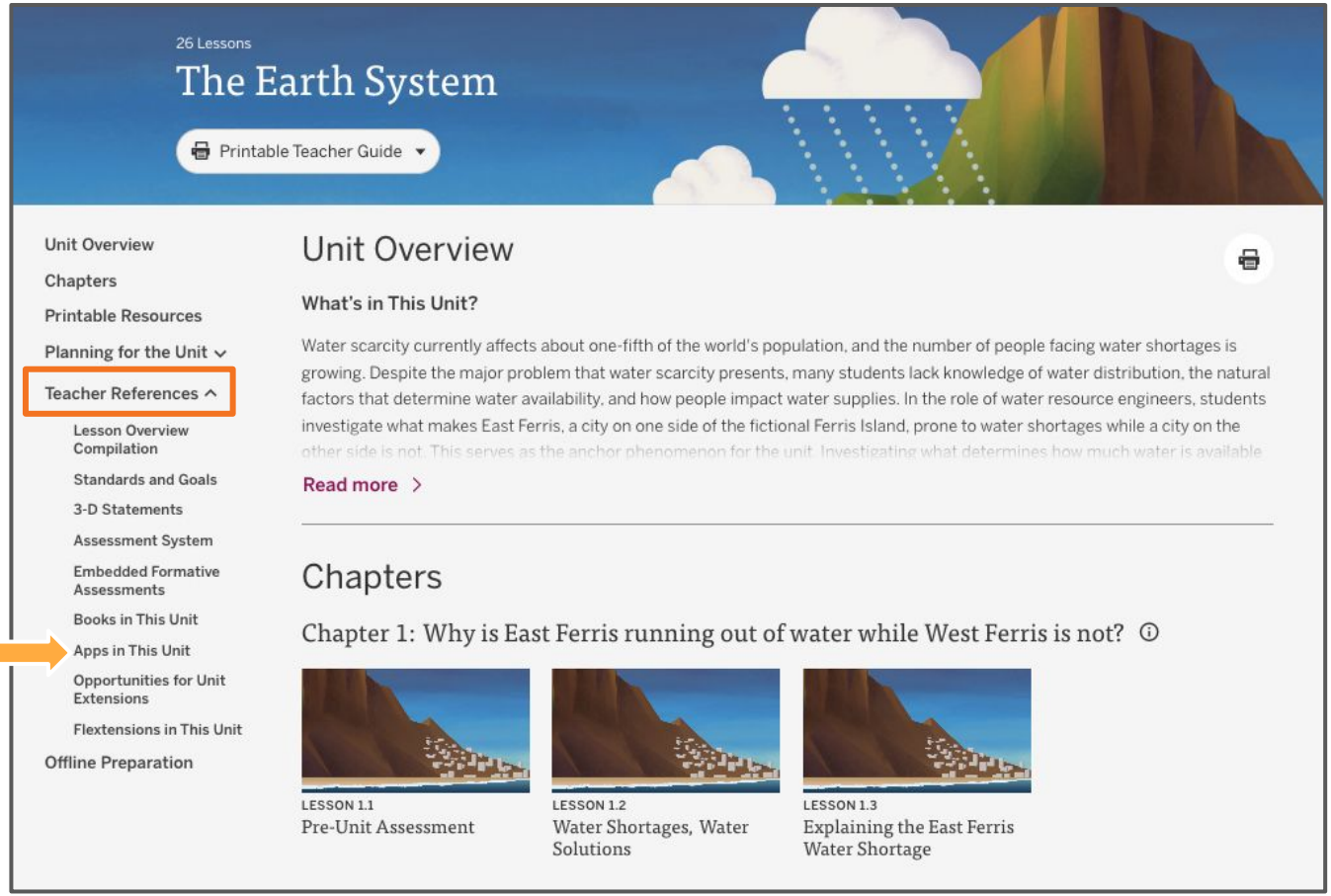
- Printable Resources
- “Planning for the Unit” documents
- Teacher References



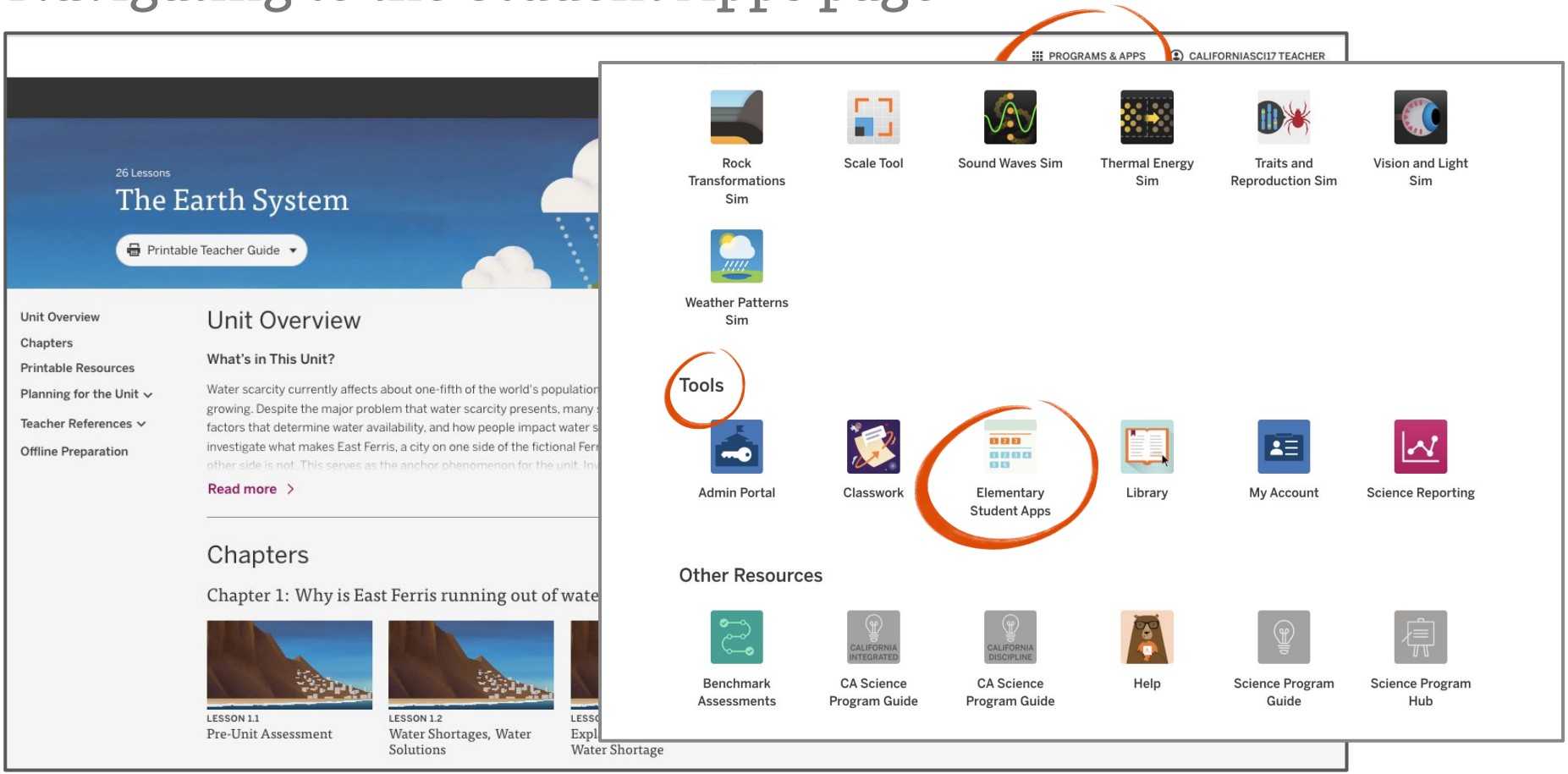
Key Unit Documents for Unit Planning

Apps in this Unit

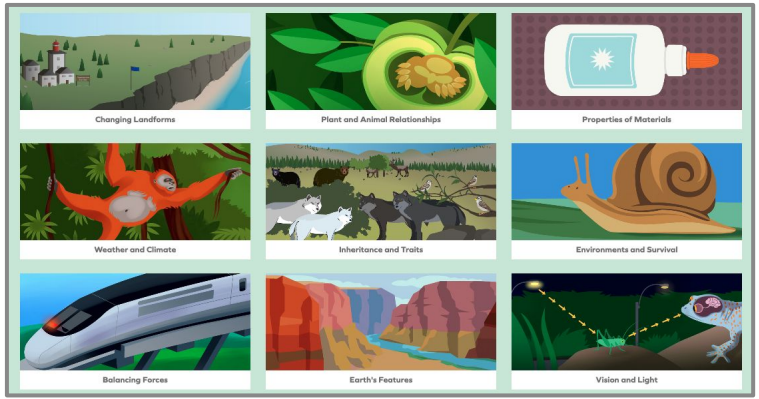
Let's take a few minutes to review the **Practice Tools and Simulations** in this unit document and explore the digital tools

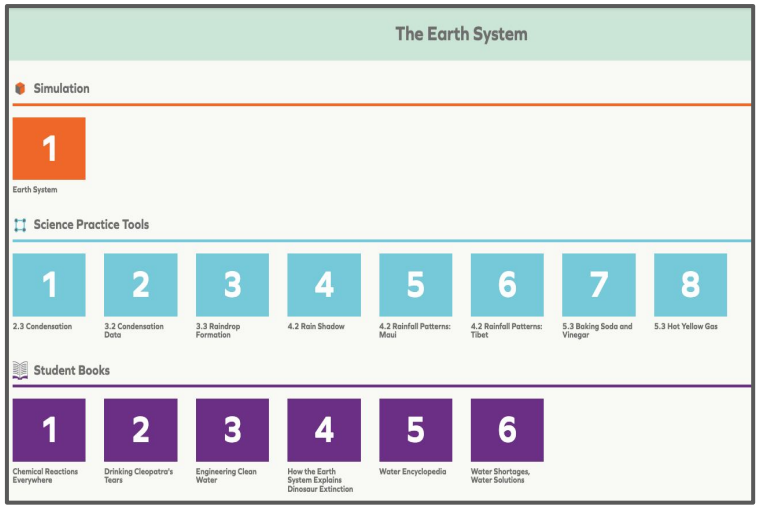


Navigating to the Student Apps page



Student Apps page

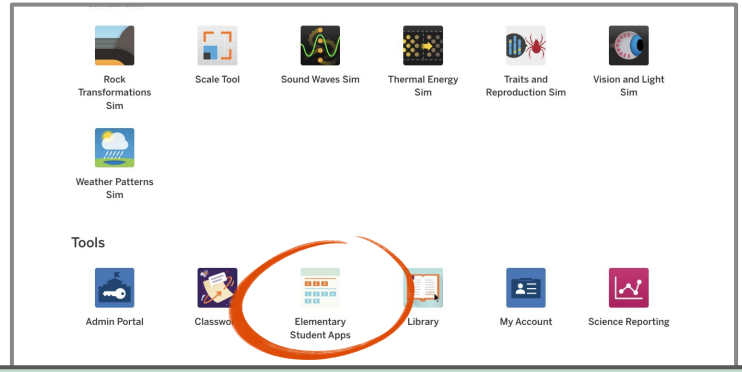


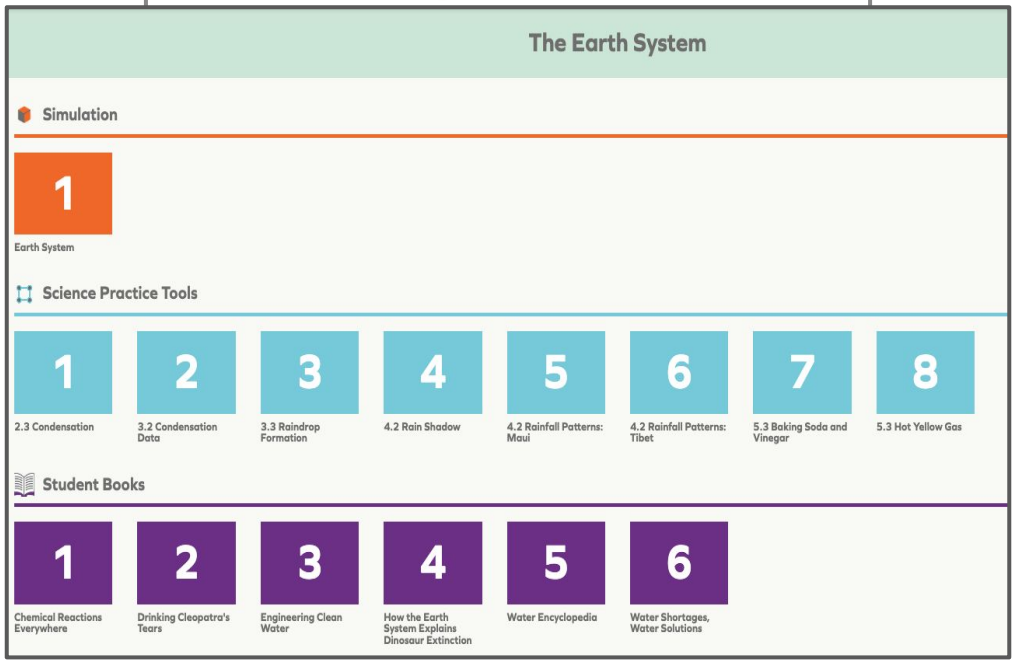


Explore the Student Apps Page

Familiarize yourself with the Program Hub.

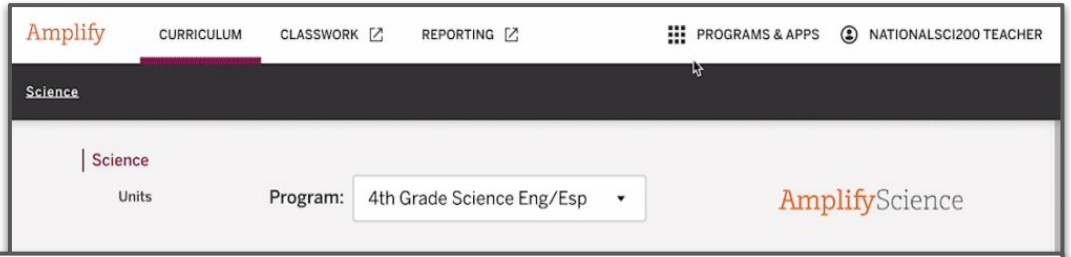
Be ready to share one resource you've found that you'll use while planning and teaching.

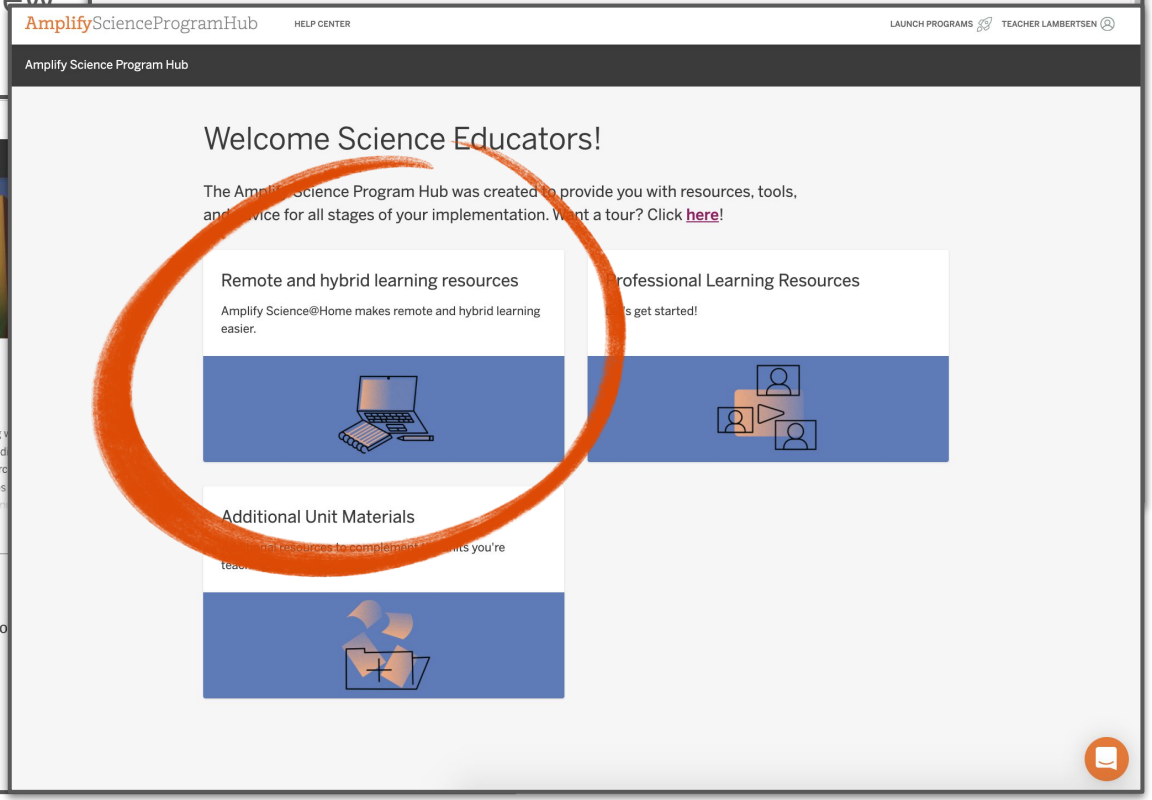


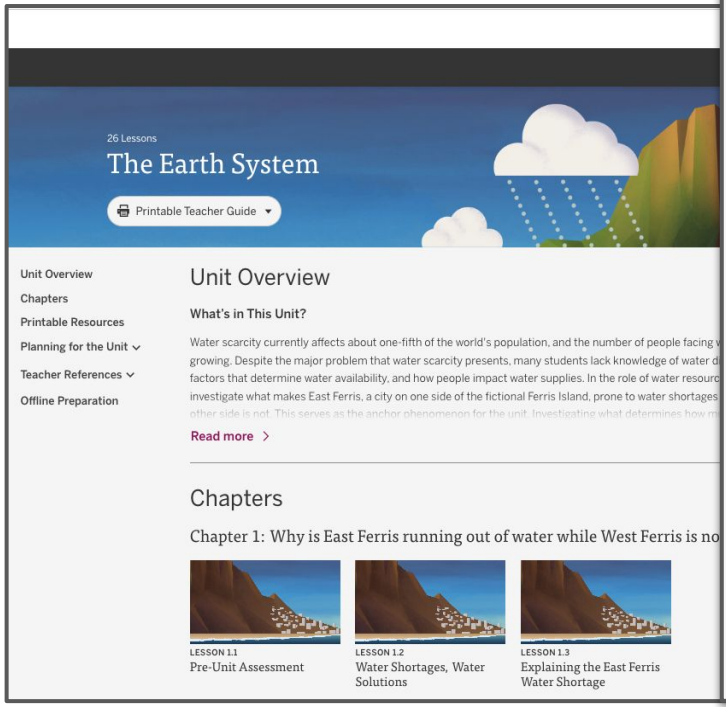


Program Hub

Use the Amplify Science Program Hub to find useful resources for implementing Amplify Science, including unit overview videos and planning tools.







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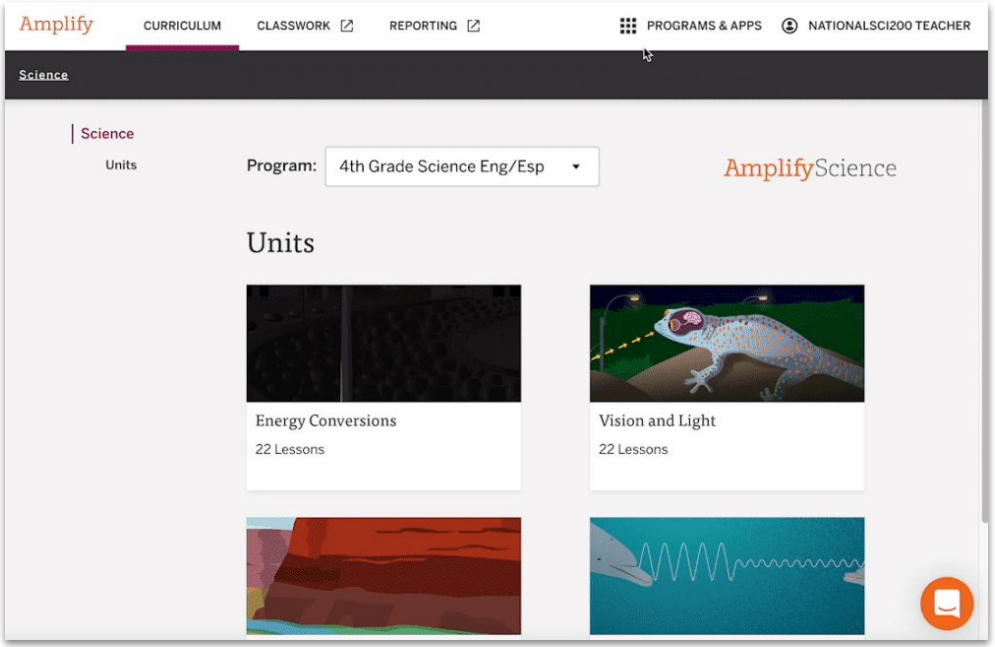
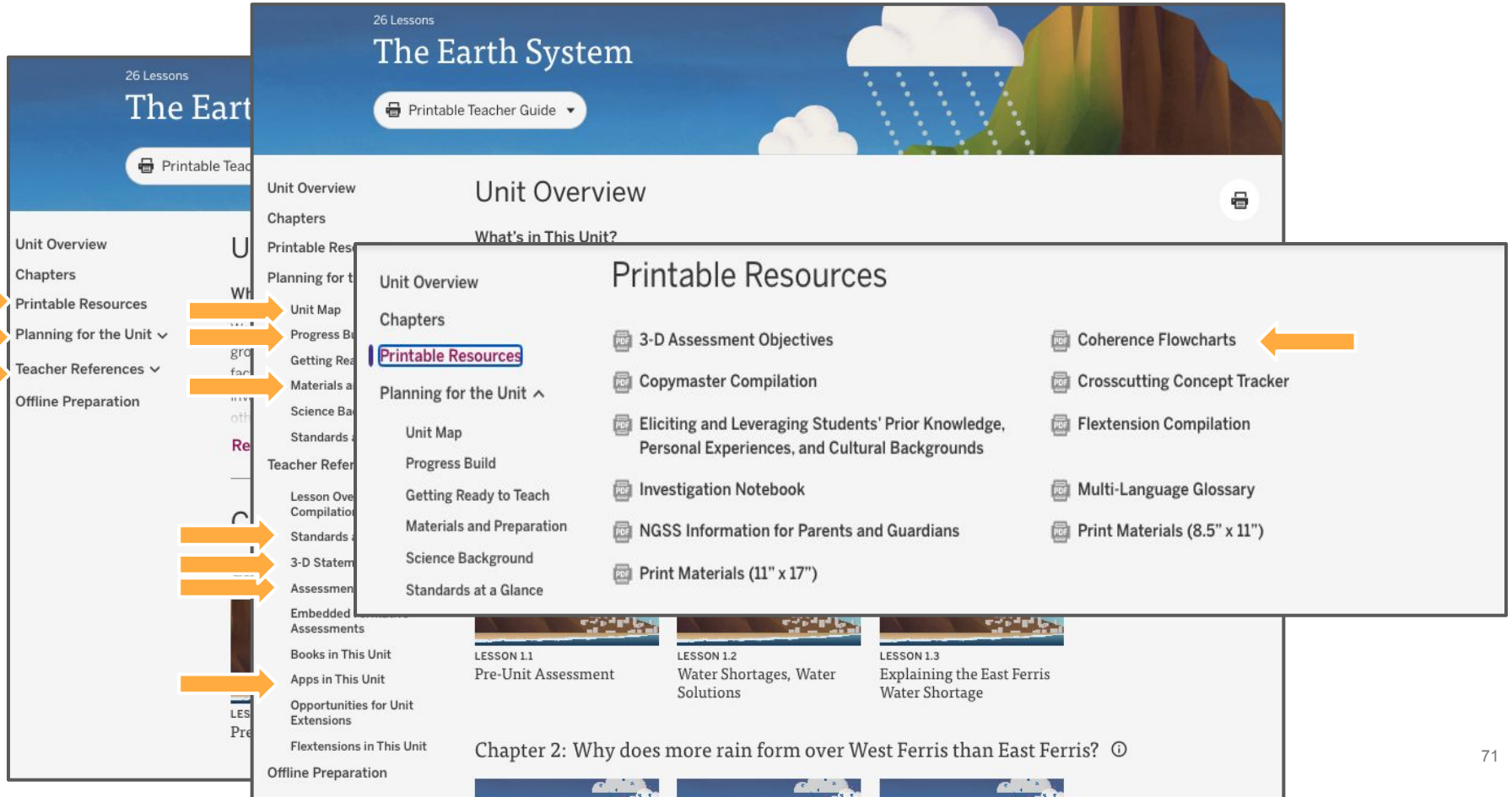


Key Unit Documents for Unit Planning



Core Unit Planning & Internalization

Unit Title: 1

Overview

[Resources: Unit Overview, Teacher's Guide, Coherence Flowchart, Unit Map, 3-D Statements]

What is the phenomenon/real-world problem students are investigating in your unit? 2

Student Role: 3

Unit Question: 4

Relationship between the Unit Phenomenon and Unit Question: 5

By the end of the unit, students figure out... 6

How do students engage with three-dimensional learning to figure out the phenomenon/real-world problem in your unit? 7

1

Unit Guide resources:
- **Unit Overview**
- **Unit Map**
- ***Coherence Flowchart***

Unit Guide resources:
- **Lesson Overview Compilation**
- **Unit Overview**

Unit Guide resources:
- **Unit Map**

Unit Guide resources:
- **3D Statements at the Unit Level**

Core Unit Planning & Internalization

Unit Title:	The Earth System

Overview

[Resources: Unit Overview, Teacher's Guide, Coherence Flowchart, Unit Map, 3-D Statements]

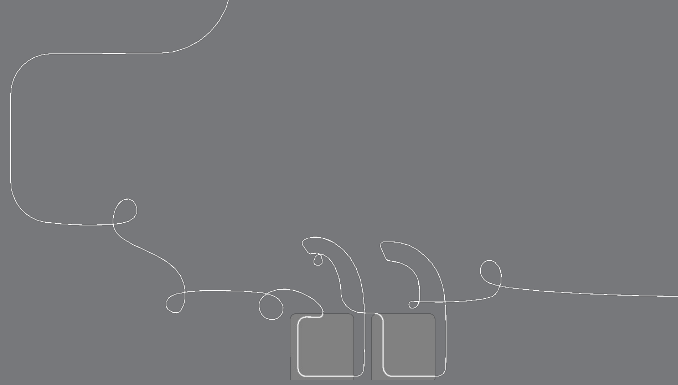
What is the phenomenon/real-world problem students are investigating in your unit?	Student Role:
East ferris is having a water shortage while West Ferris is not. What is causing the water shortage on one part of the island.	Water Resource Engineers
Unit Question:	**Relationship between the Unit Phenomenon and Unit Question:**
What can determine how much water is available for human use?	Investigating what determines how much water is available for human use leads to students to explore how parts of the Earth system interact.

By the end of the unit, students figure out...

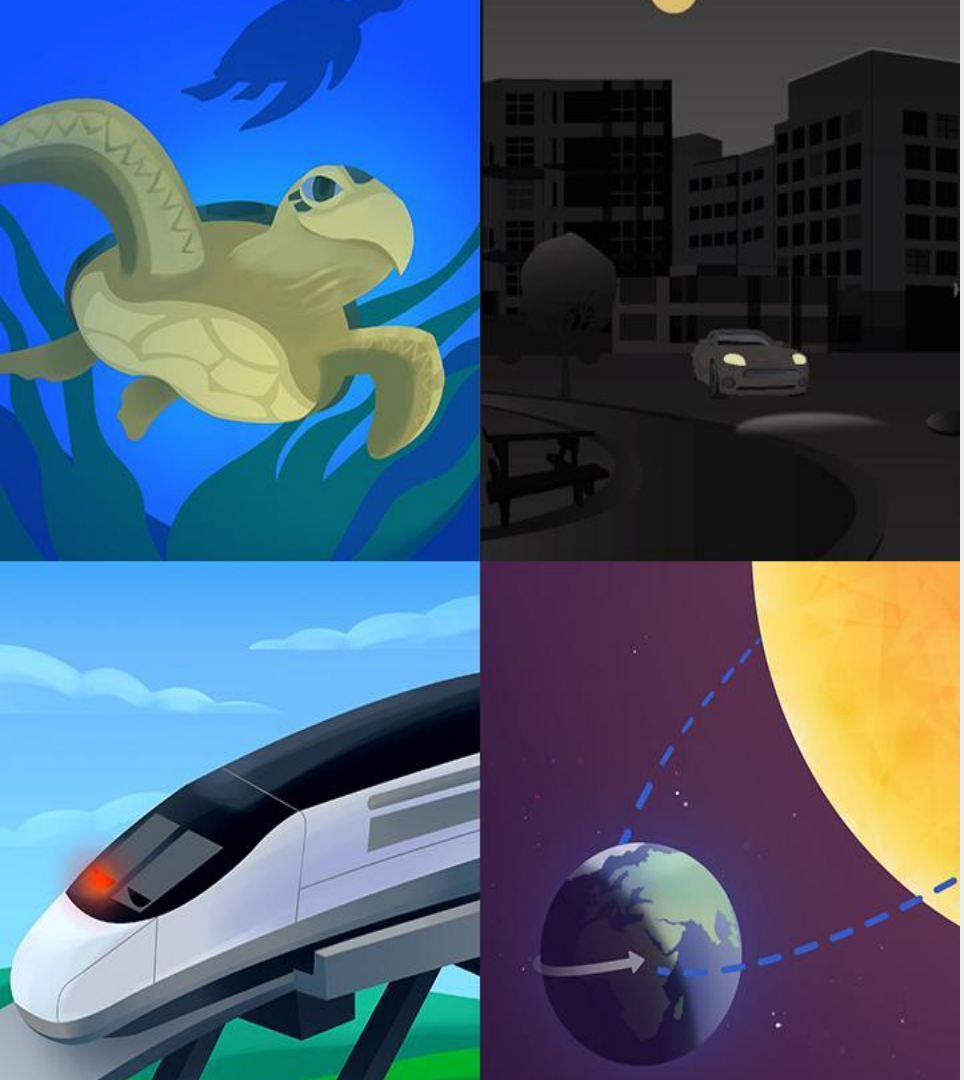
Students figure out what is causing the water shortage on one part of the island and not the other.

How do students engage with three-dimensional learning to figure out the phenomenon/real-world problem in your unit?

Students investigate how interactions between the parts of the Earth system affect the movement and distribution of water (systems and system models), and they apply their understanding to design solutions for a water shortage. Students also obtain reactions, even though no matte is created or destroyed (energy and matter).

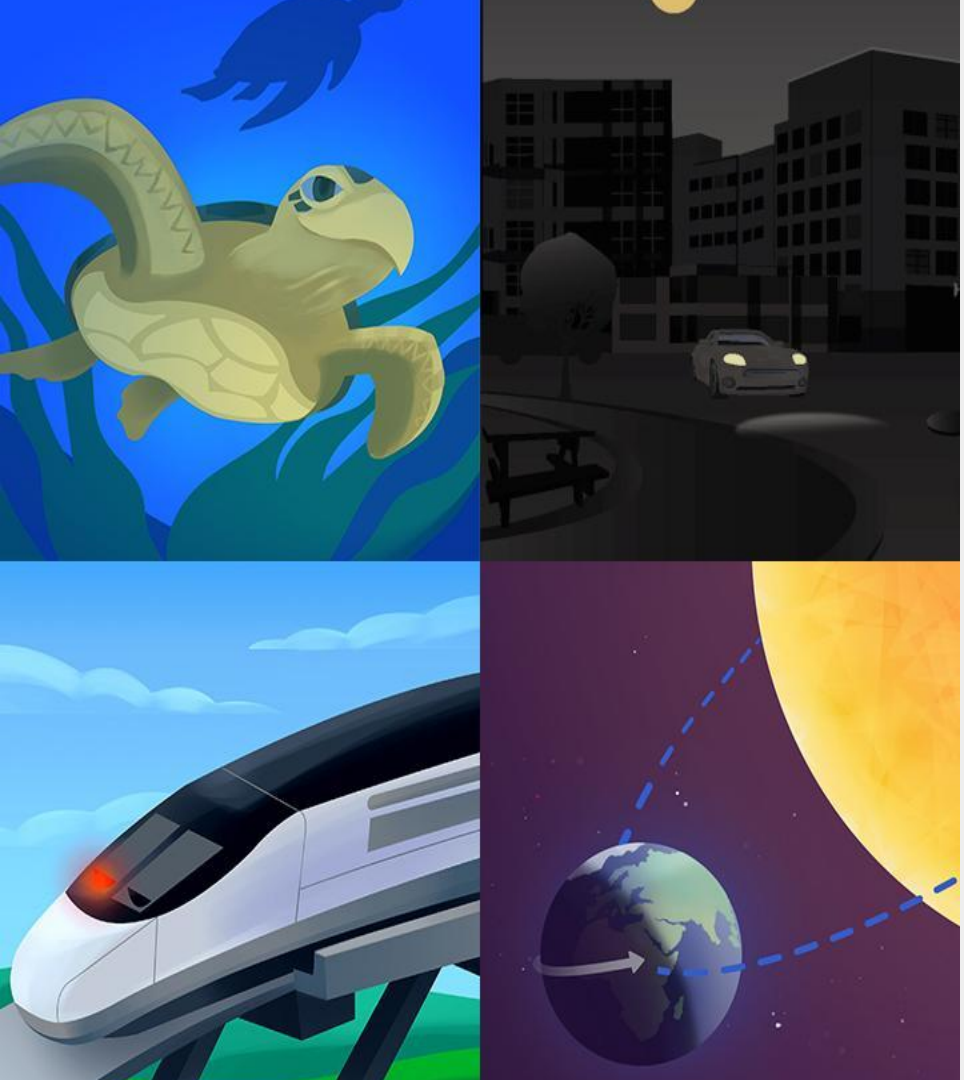


Questions?



Plan for the day: Part 1

- Introduction and Framing
- NGSS & 3D Learning
- Phenomenon-based Instruction
- Unit Internalization
- Additional Resources
- Closing



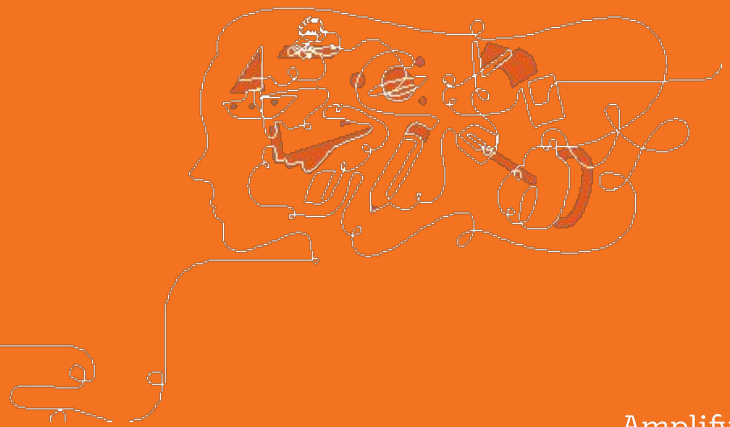
Plan for the day: Part 1

- Introduction and Framing
- NGSS & 3D Learning
- Phenomenon-based Instruction
- Unit Internalization
- Additional Resources
- Closing

Overarching goals

- ✓ Explain how students engage in phenomenon based and 3D learning to construct an understanding of the science concepts introduced in the unit *The Earth System.*
- ✓ Internalize the unit and apply your new understanding to plan for the diverse needs of your classroom and students

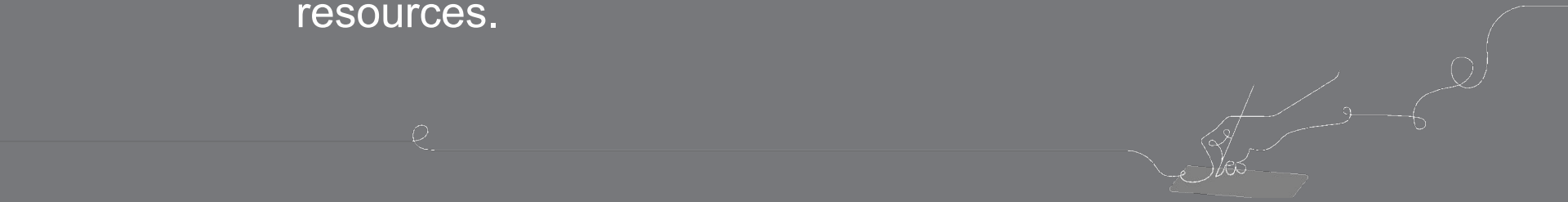
Part 2:
Guided Planning

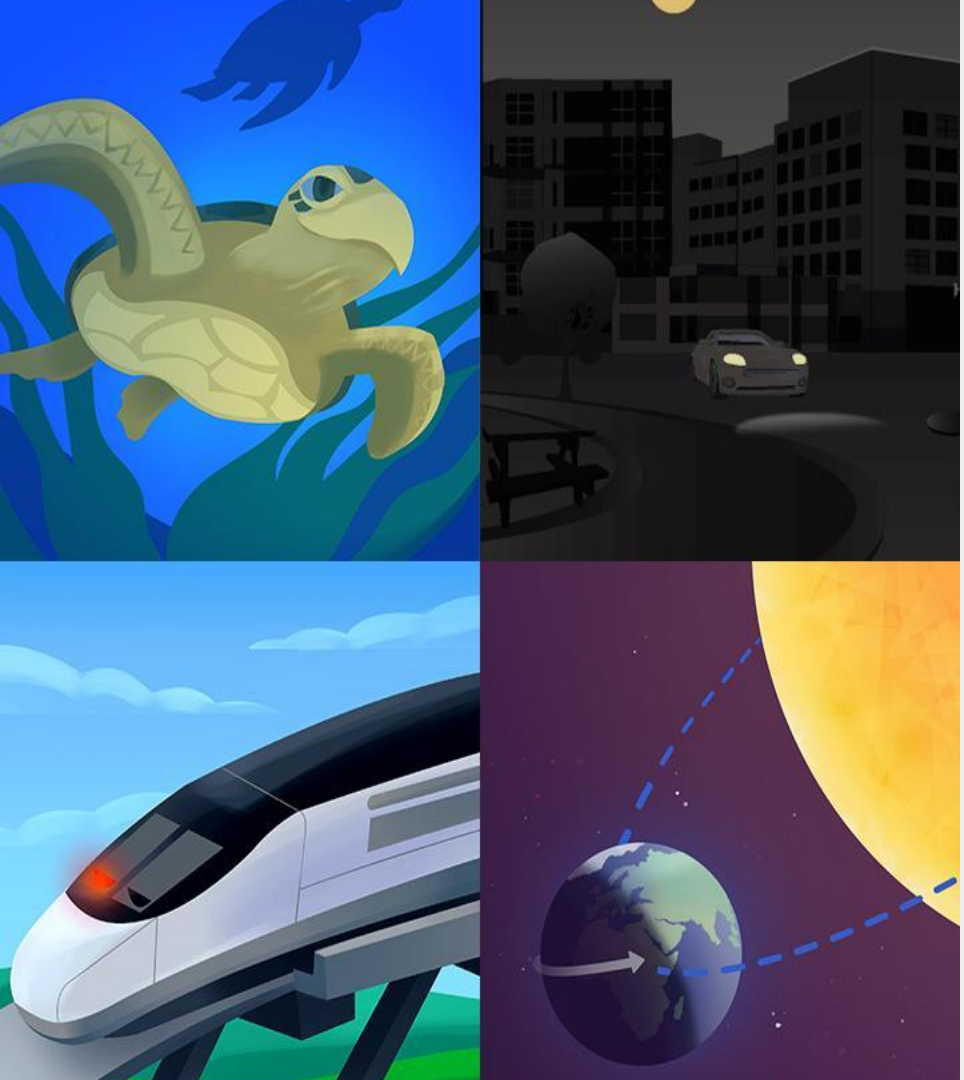


Overarching goals

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

- ❑ Describe what teaching and learning look like in Amplify Science.
- ❑ Prepare to teach using Amplify Science resources.

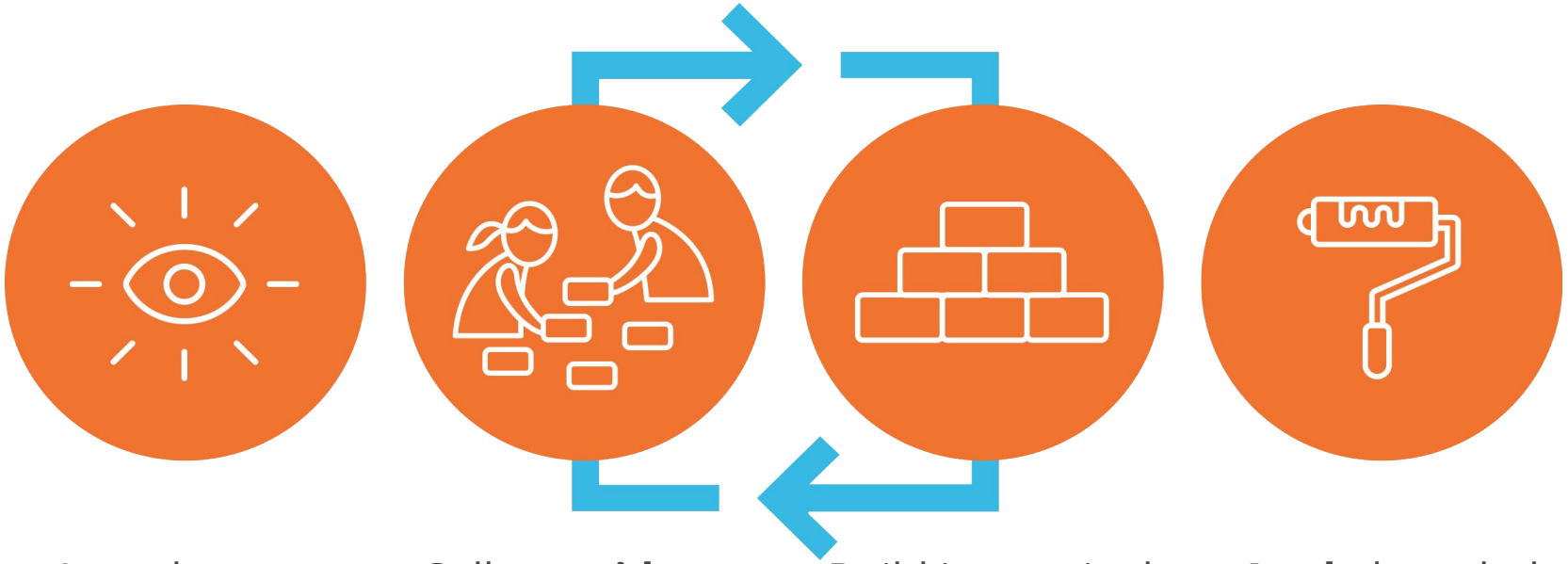




Plan for the day: Part 2

- Teaching and Learning in an Amplify Science Lesson
- Instructional Approach Reflection
- Planning a Lesson
- Closing

Amplify Science Approach



Introduce a **phenomenon** and a related problem

Collect **evidence** from multiple sources

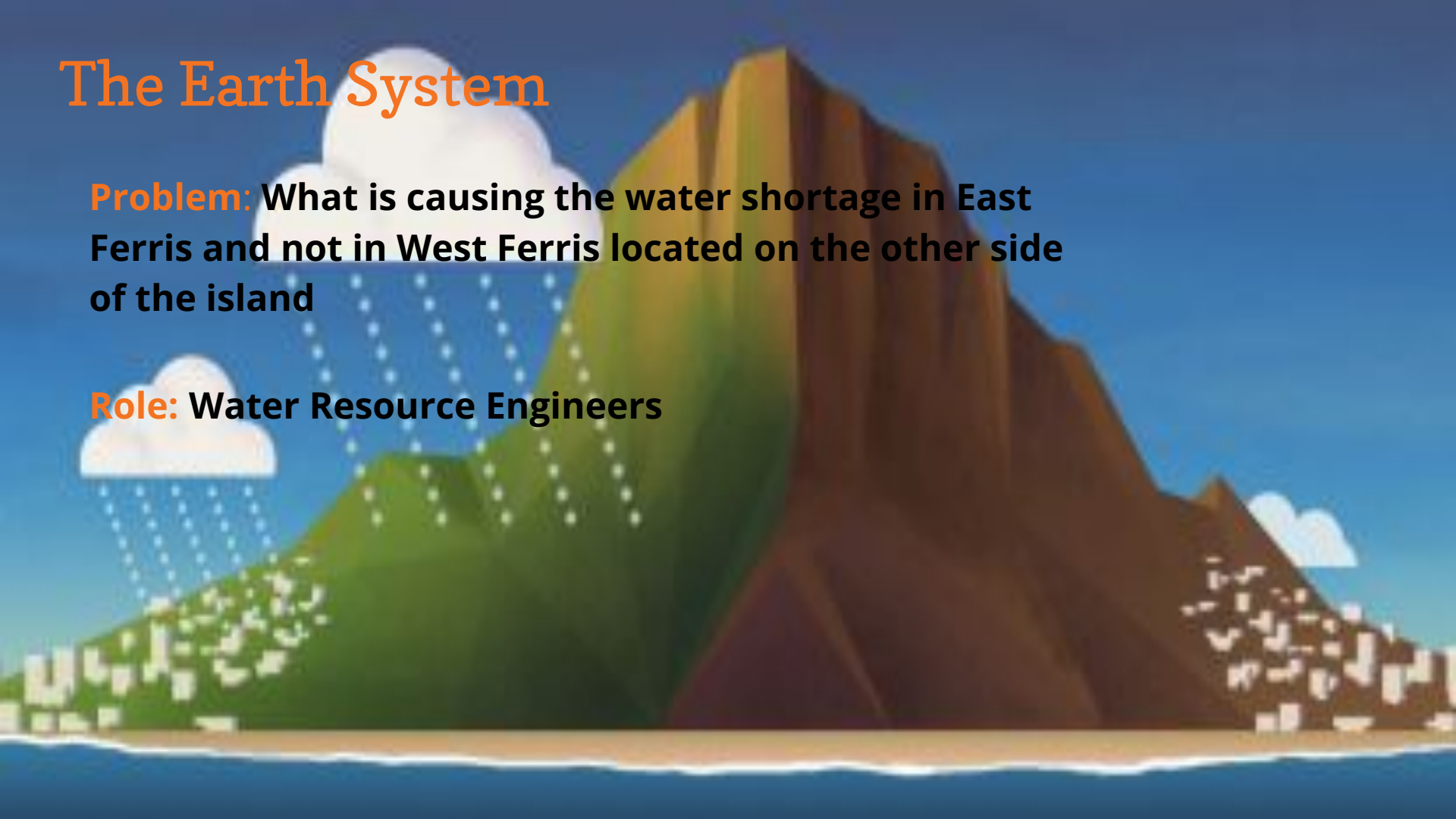
Build increasingly complex **explanations**

Apply knowledge to solve a different problem

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**



The Earth System

Coherent Storylines

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

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

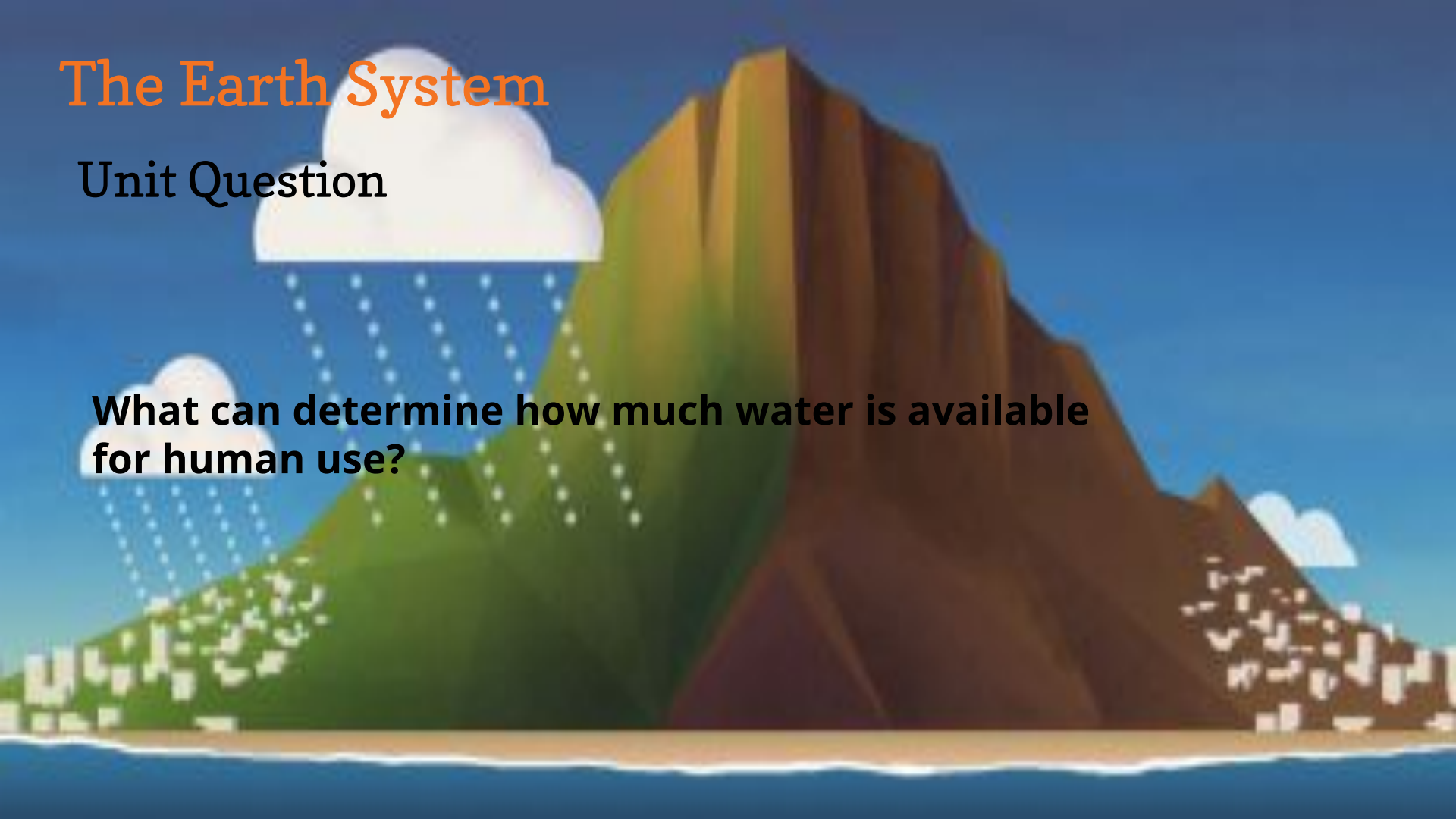
Why is more water vapor getting cold over West Ferris than East Ferris?

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

How can East Ferris turn wastewater into clean freshwater?

The Earth System

Unit Question

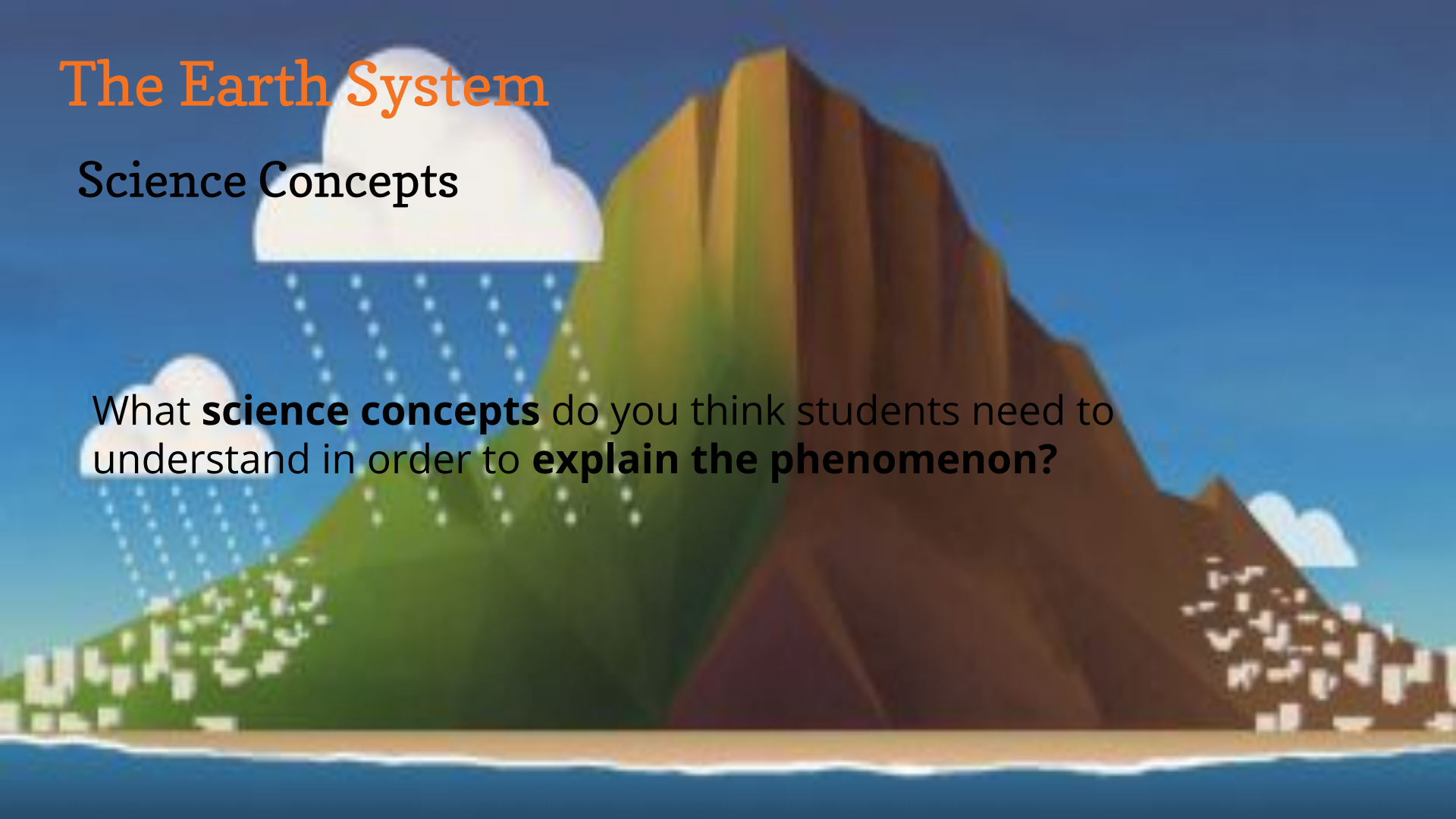


What can determine how much water is available for human use?

The Earth System

Science Concepts

What **science concepts** do you think students need to understand in order to **explain the phenomenon?**



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 1

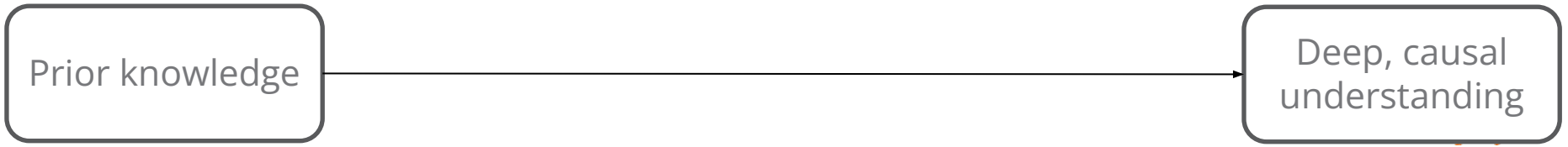
Rain can happen when water vapor gets cold and condenses into liquid water.

Level 2

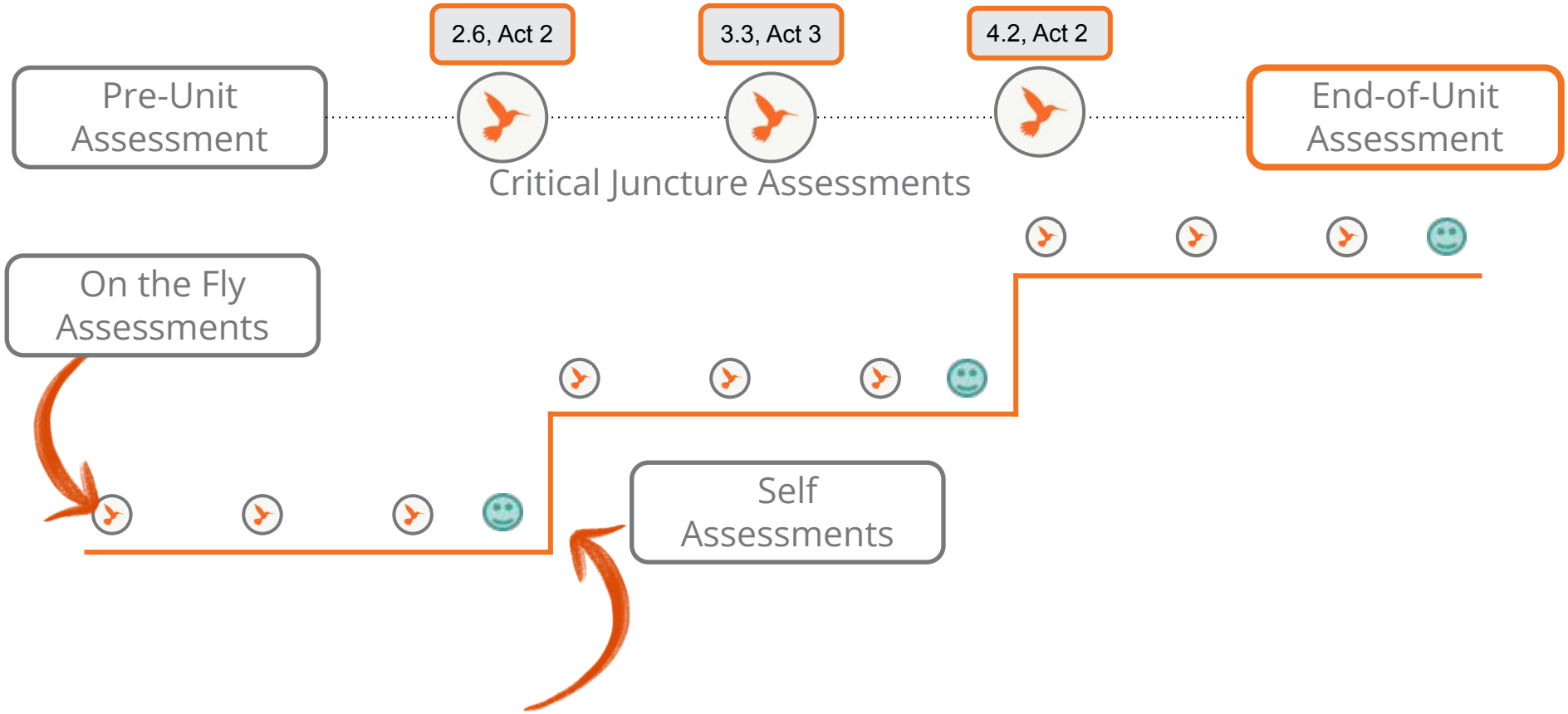
Water vapor condesnses as it moves higher, to where the atmosphere is colder.

Level 3

Mountains can redirect water vapor higher in the atmosphere.

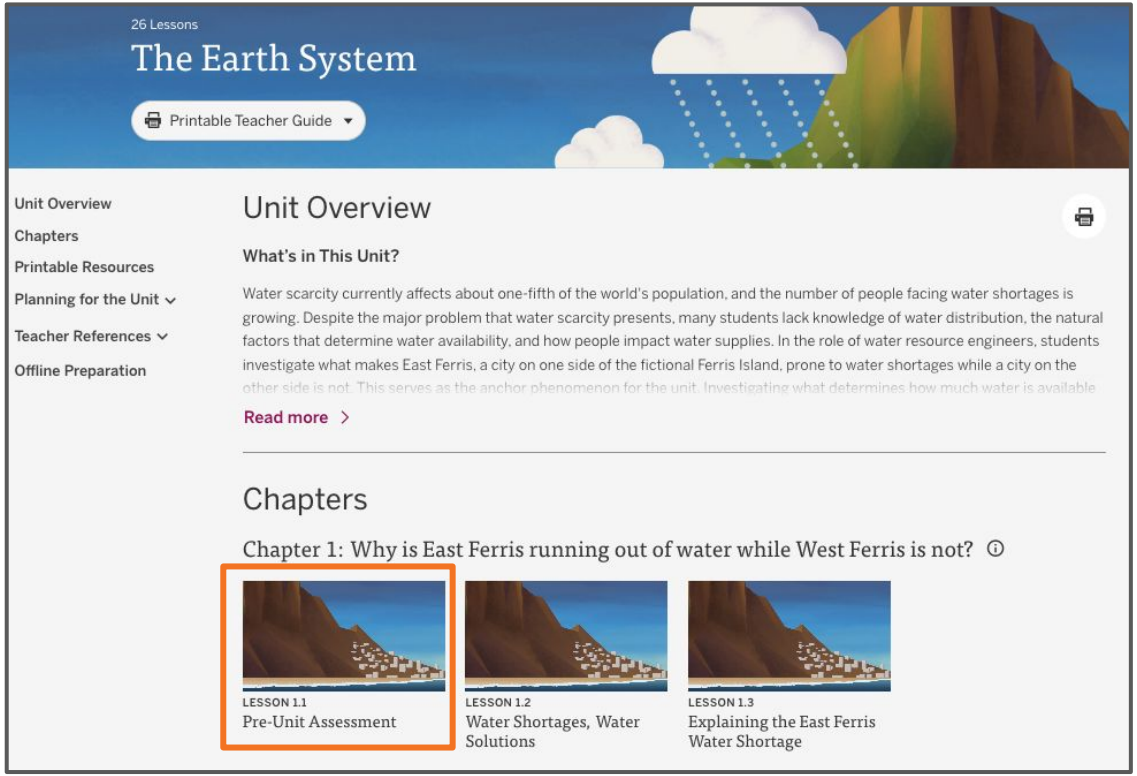


K-5 Assessment System

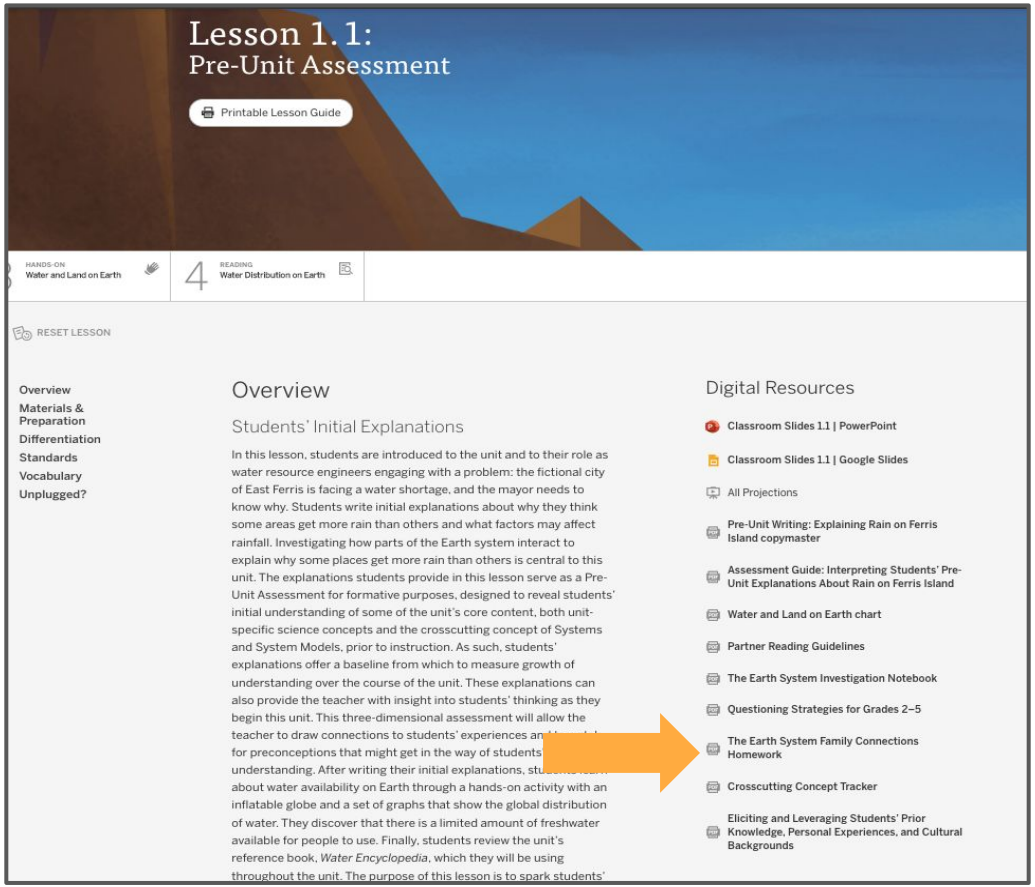


Beginning the Unit

The first lesson of every Unit is a pre-unit assessment.



The Earth System Family Connection



Lesson 1.1:
Pre-Unit Assessment

Printable Lesson Guide

HANDS-ON
Water and Land on Earth

4 READING
Water Distribution on Earth

RESET LESSON

Overview
Materials & Preparation
Differentiation
Standards
Vocabulary
Unplugged?

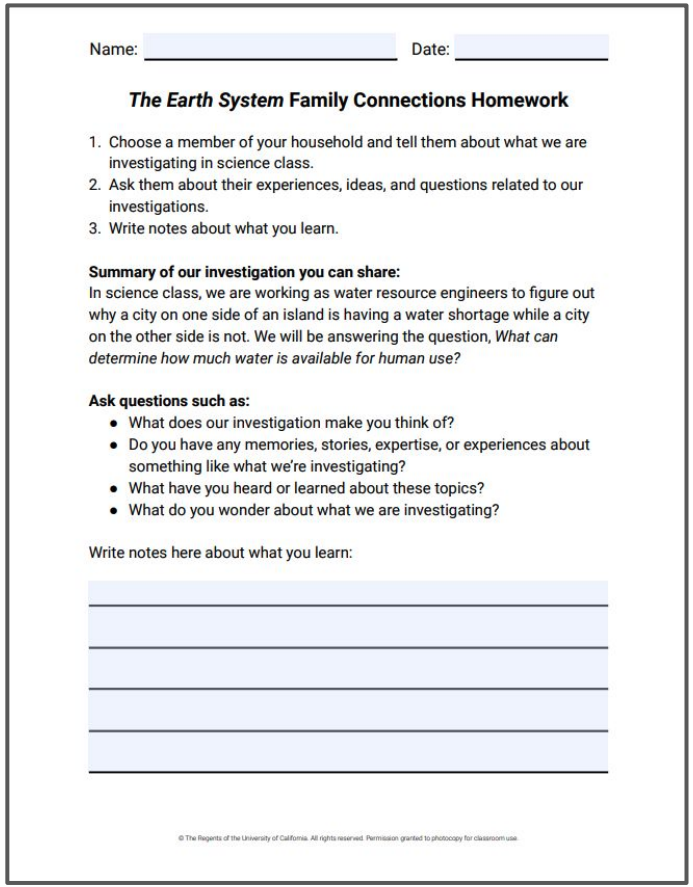
Overview

Students' Initial Explanations

In this lesson, students are introduced to the unit and to their role as water resource engineers engaging with a problem: the fictional city of East Ferris is facing a water shortage, and the mayor needs to know why. Students write initial explanations about why they think some areas get more rain than others and what factors may affect rainfall. Investigating how parts of the Earth system interact to explain why some places get more rain than others is central to this unit. The explanations students provide in this lesson serve as a Pre-Unit Assessment for formative purposes, designed to reveal students' initial understanding of some of the unit's core content, both unit-specific science concepts and the crosscutting concept of Systems and System Models, prior to instruction. As such, students' explanations offer a baseline from which to measure growth of understanding over the course of the unit. These explanations can also provide the teacher with insight into students' thinking as they begin this unit. This three-dimensional assessment will allow the teacher to draw connections to students' experiences an
for preconceptions that might get in the way of students
understanding. After writing their initial explanations, stu
about water availability on Earth through a hands-on activity with an inflatable globe and a set of graphs that show the global distribution of water. They discover that there is a limited amount of freshwater available for people to use. Finally, students review the unit's reference book, *Water Encyclopedia*, which they will be using throughout the unit. The purpose of this lesson is to spark students'

Digital Resources

- Classroom Slides 1.1 | PowerPoint
- Classroom Slides 1.1 | Google Slides
- All Projections
- Pre-Unit Writing: Explaining Rain on Ferris Island copymaster
- Assessment Guide: Interpreting Students' Pre-Unit Explanations About Rain on Ferris Island
- Water and Land on Earth chart
- Partner Reading Guidelines
- The Earth System Investigation Notebook
- Questioning Strategies for Grades 2–5
- The Earth System Family Connections Homework
- Crosscutting Concept Tracker
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds



Name: _____ Date: _____

The Earth System Family Connections Homework

1. Choose a member of your household and tell them about what we are investigating in science class.
2. Ask them about their experiences, ideas, and questions related to our investigations.
3. Write notes about what you learn.

Summary of our investigation you can share:
In science class, we are working as water resource engineers to figure out why a city on one side of an island is having a water shortage while a city on the other side is not. We will be answering the question, *What can determine how much water is available for human use?*

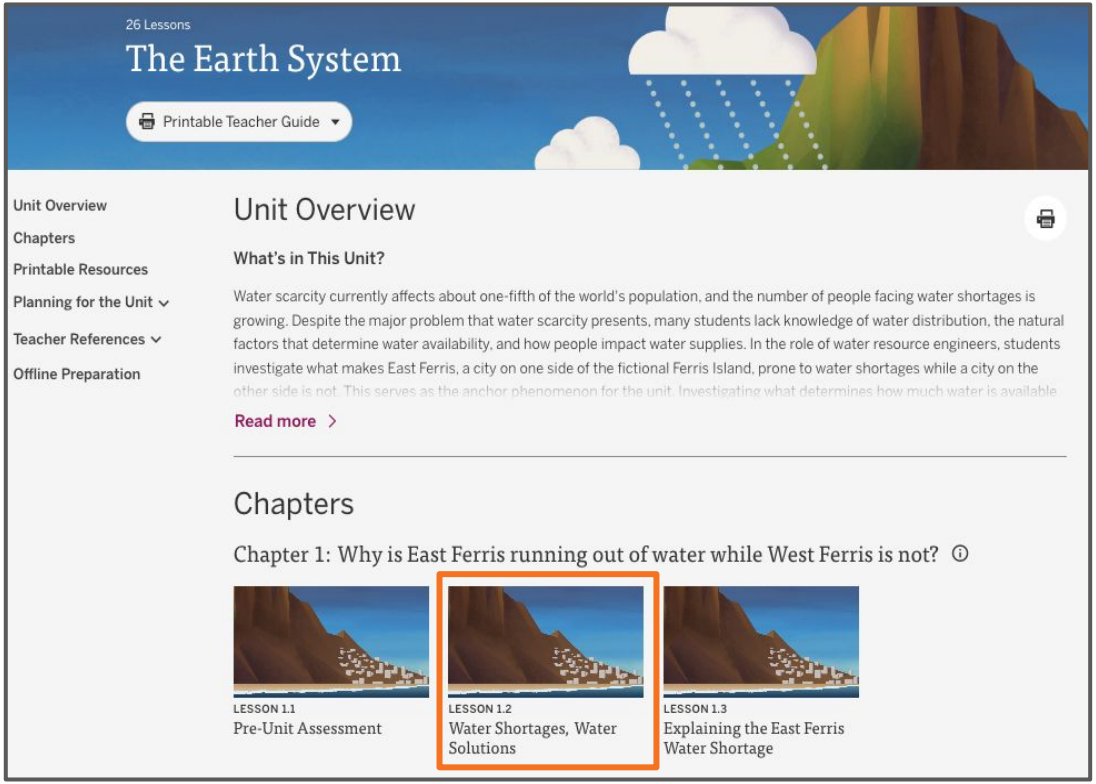
Ask questions such as:

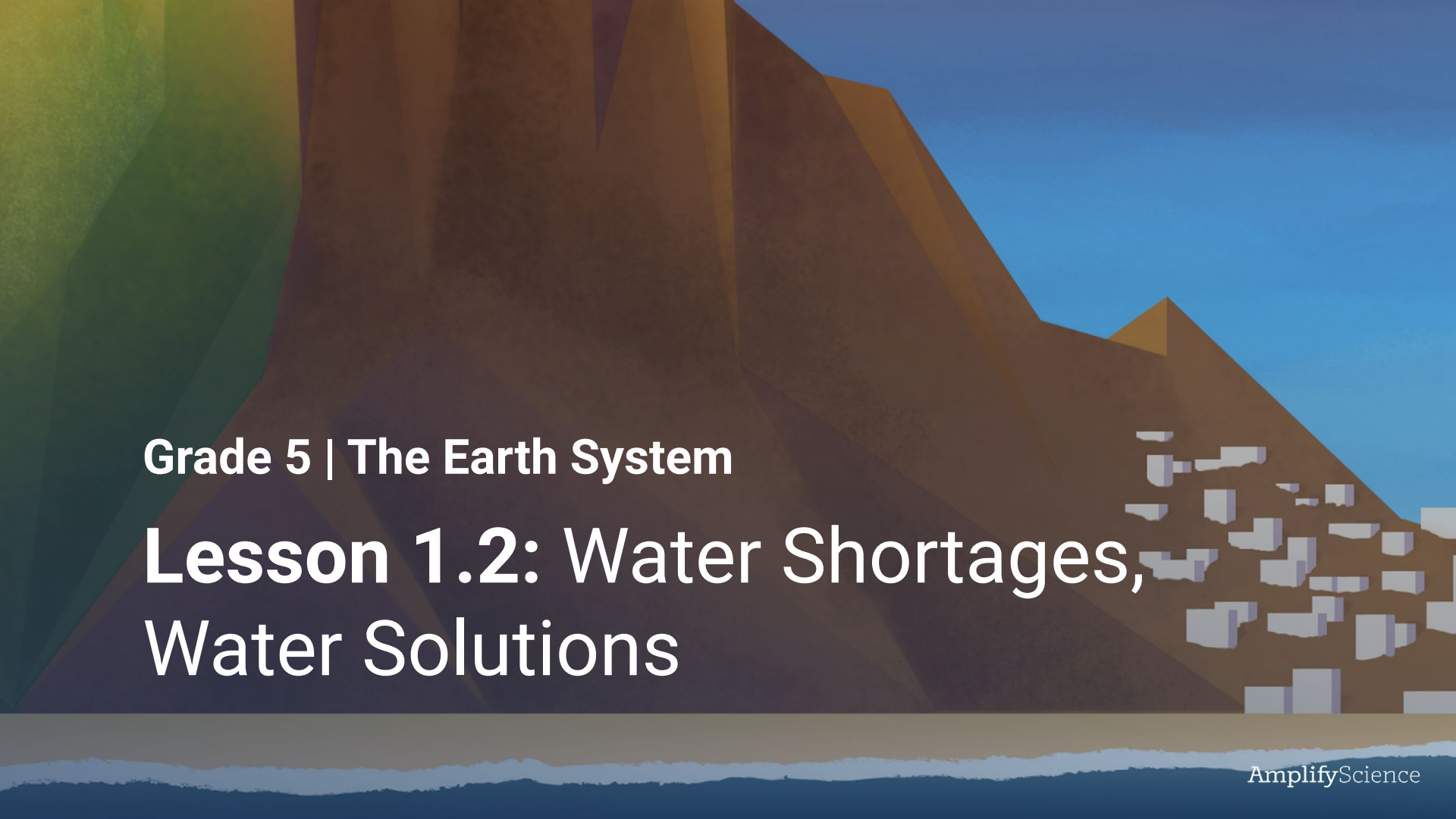
- What does our investigation make you think of?
- Do you have any memories, stories, expertise, or experiences about something like what we're investigating?
- What have you heard or learned about these topics?
- What do you wonder about what we are investigating?

Write notes here about what you learn:

Beginning the Unit

We will be looking at Chapter 1, Lesson 2 for our model lesson.





Grade 5 | The Earth System

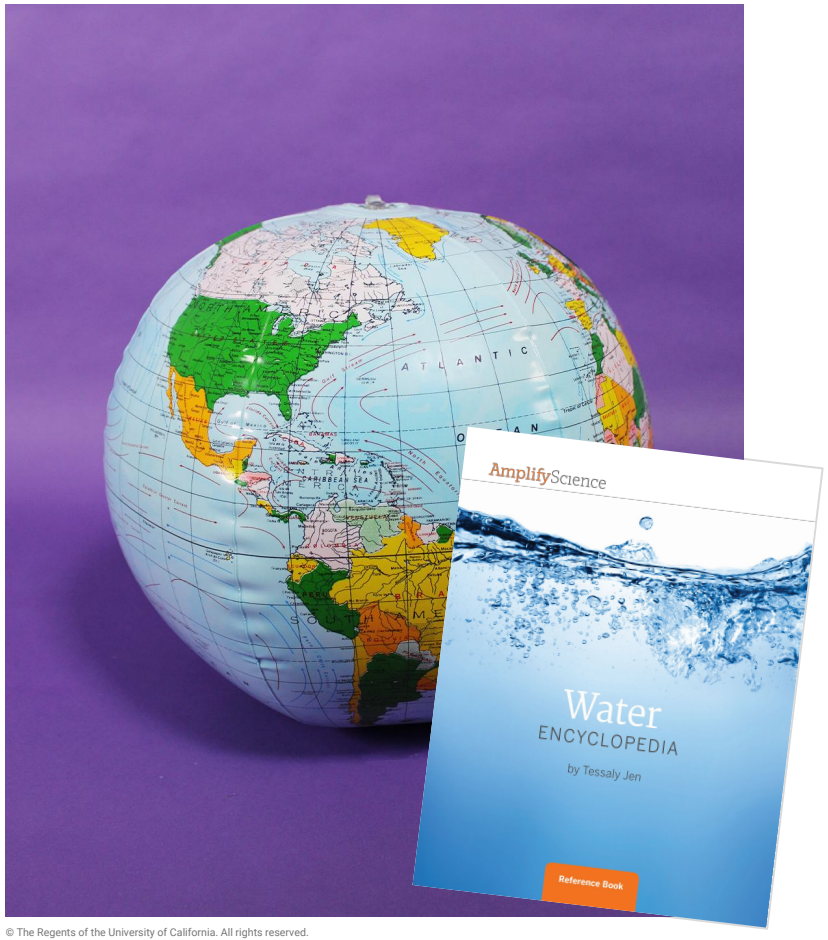
Lesson 1.2: Water Shortages, Water Solutions

AmplifyScience

5 MIN

Activity 1

Discussing Water Use



In the previous lesson, we used a globe and a book to learn about water.

What did we learn about where **most of the water** is on Earth? What about where freshwater is on Earth?

Chapter 1 Question

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

If there is so much water on Earth, and if Ferris Island is surrounded by water, **how could East Ferris possibly be running out of water?**

How do you use water?

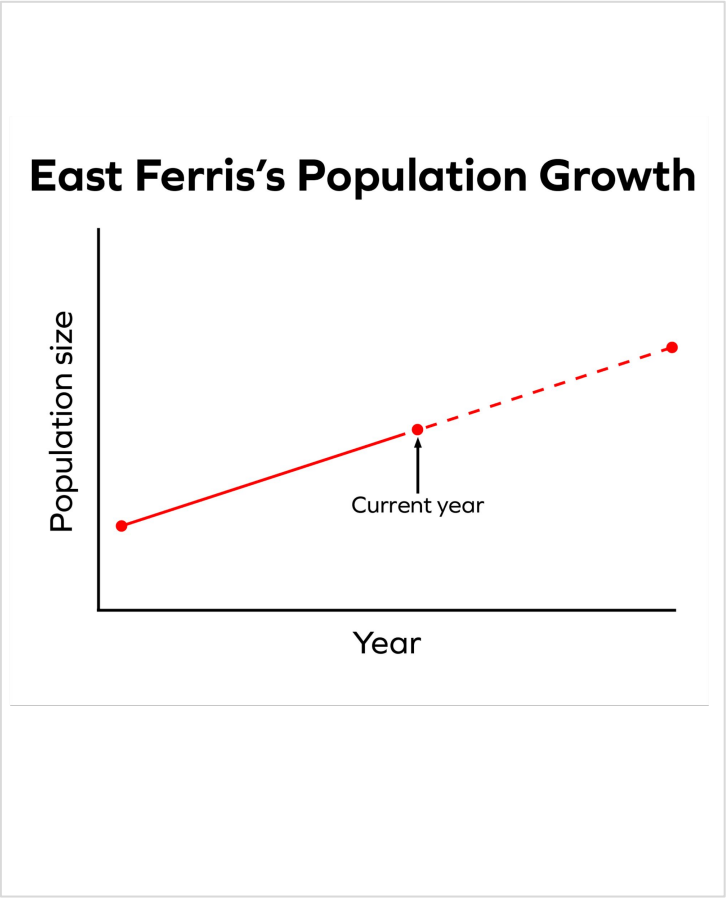
Think about your day at **home** and your day at **school** and how you use water at those places.

Vocabulary

resource

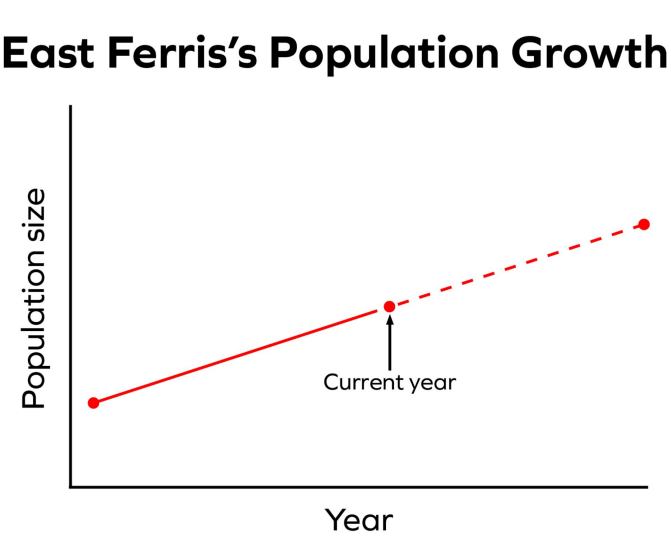
a supply of something that is useful

East Ferris is on an island, so it is surrounded by **salt water** in the ocean. Like us, people on Ferris Island need **freshwater,** not salt water, for their daily activities.



Mayor McKnight provided this data about the population in East Ferris.

What do you notice?



What do you think the **population size** has to do with the **water shortage?**

Today, we are going to investigate this question:

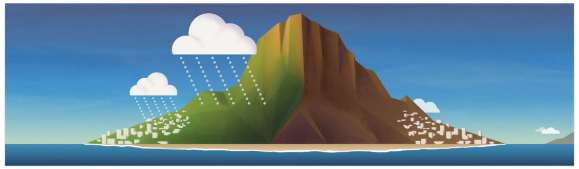
How can people affect how much freshwater is available?

15 MIN

Activity 2

Introducing Synthesizing

AmplifyScience

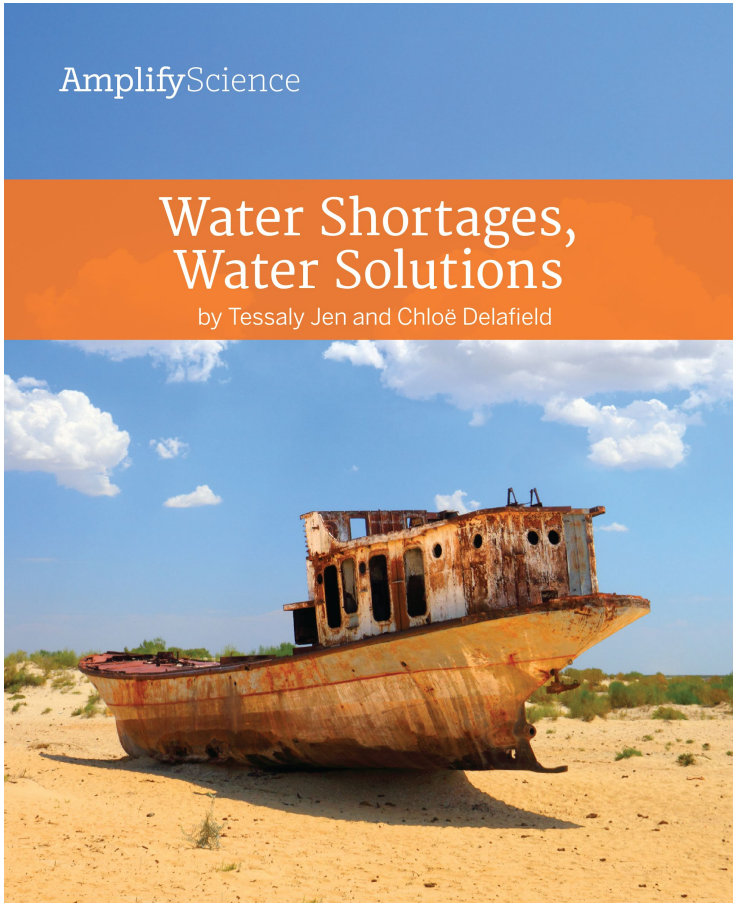


The Earth System:

Investigating Water Shortages

Investigation Notebook

We are going to use an **Investigation Notebook** like scientists use.



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

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:

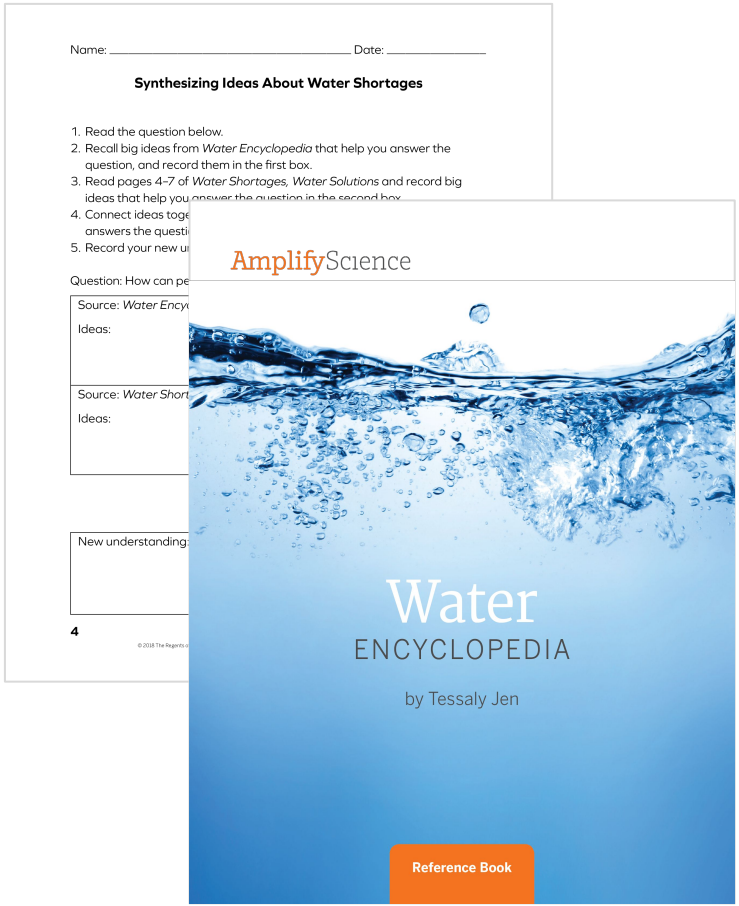
Source: *Water Shortages, Water Solutions*

Ideas:

New understanding:

Turn to page 4 in your notebooks.

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



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*?

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:

New understanding:

This is one big idea we learned from *Water Encyclopedia*.

In your notebooks, **record** this big idea as well as any big ideas you discussed with your partner.

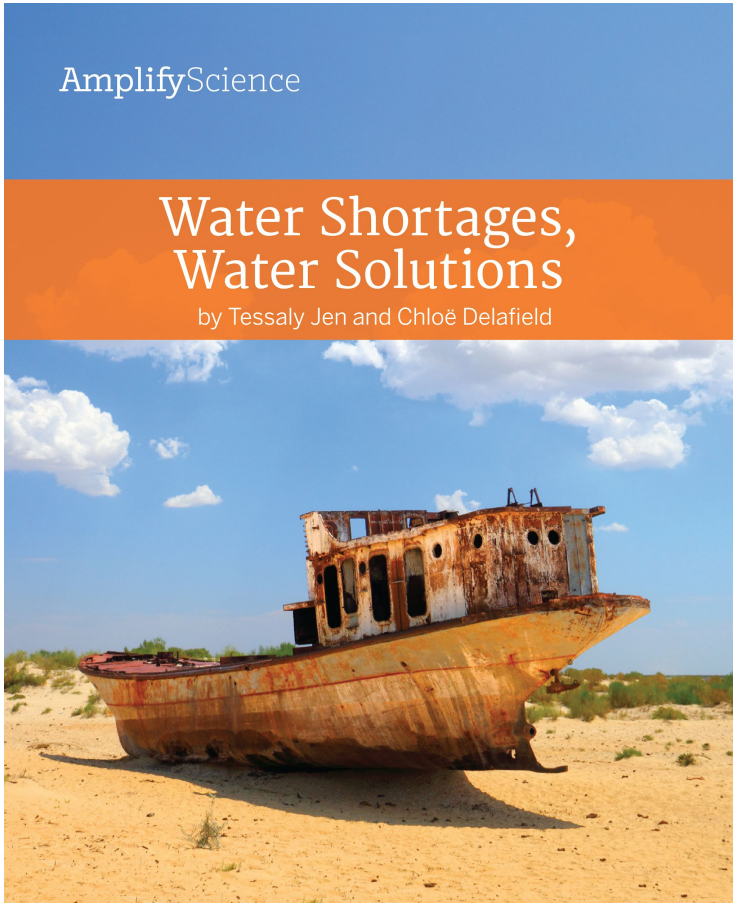
25 MIN

Activity 3

Partner Reading

Remember that we are investigating this question:

How can people affect how much freshwater is available?



Take a few minutes to look through the book. Notice how it is **organized.**

Introduction

Everyone needs water to survive. However, more than a billion people around the world do not have enough water. Water is a limited **resource**, and there is often not enough of it available where and when people need it. There are many things that can cause a lack of available water, called a water shortage. A water shortage doesn't necessarily mean there is no water around. It means that there is not enough clean, usable freshwater available to meet people's needs.

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 reservoir collects freshwater for people to use. The water level is very low because of drought. The water normally goes to the top of the white part of the hill.

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

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.
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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.

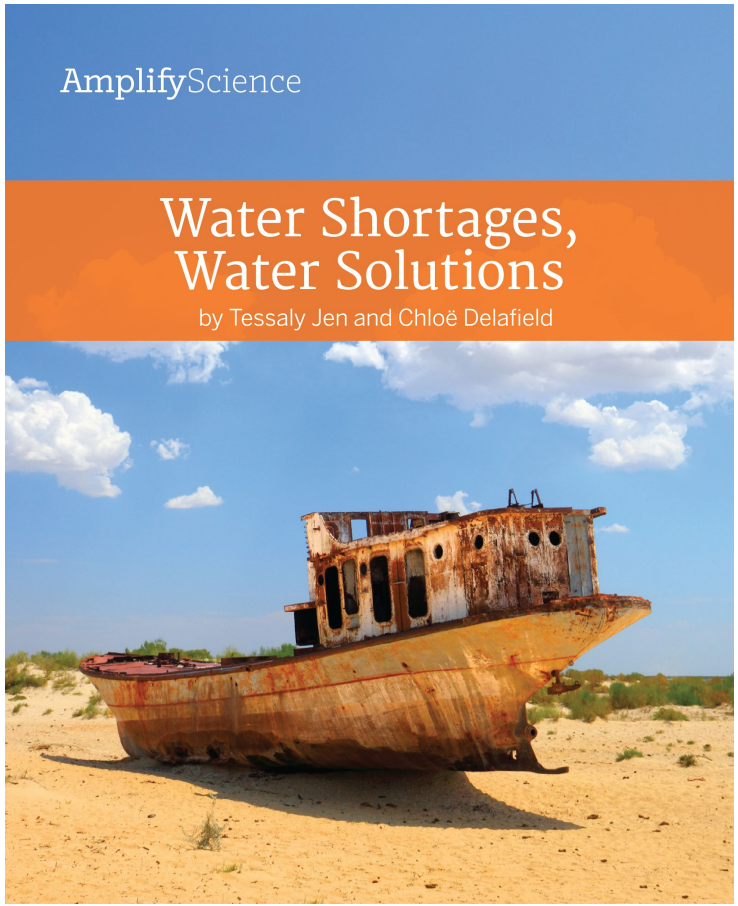
Source: *Water Shortages, Water Solutions*

Ideas:

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

New understanding:

Record this big idea in your notebooks.



Read the rest of the book. **Discuss and record** any other big ideas from the book that you think help answer our Investigation Question.

15 MIN

Activity 4

Synthesizing Ideas About Water Shortages

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.

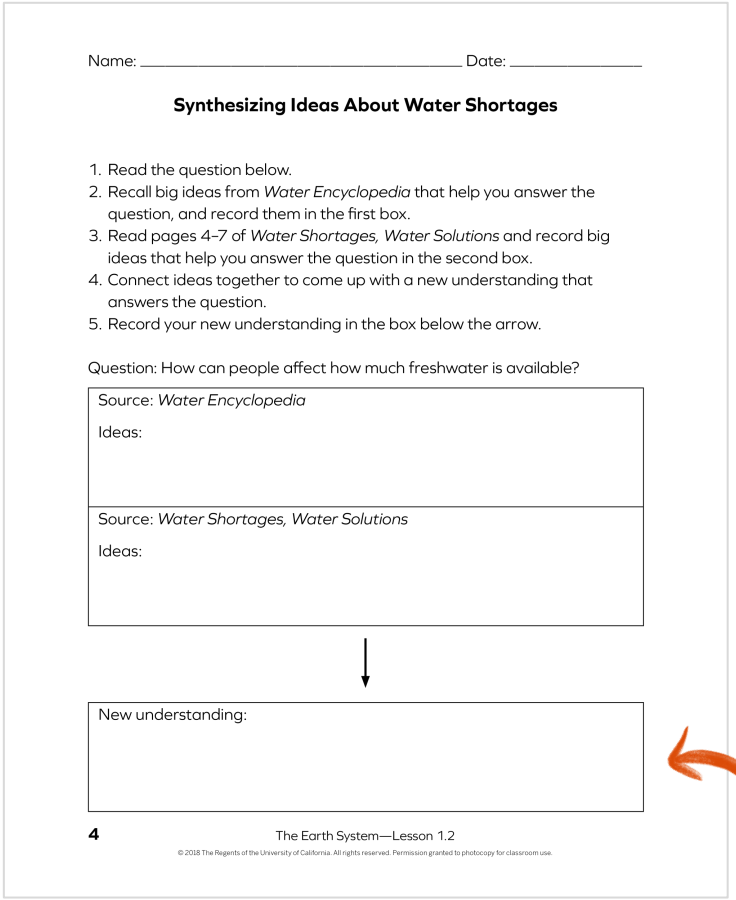
Question: How can people affect how much freshwater is available?

Source: *Water Encyclopedia* Ideas:
Source: *Water Shortages, Water Solutions* Ideas:

↓

New understanding:

What **big ideas** did you discuss and record as you read *Water Shortages, Water Solutions*?



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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:

4 The Earth System—Lesson 1.2

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.
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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.

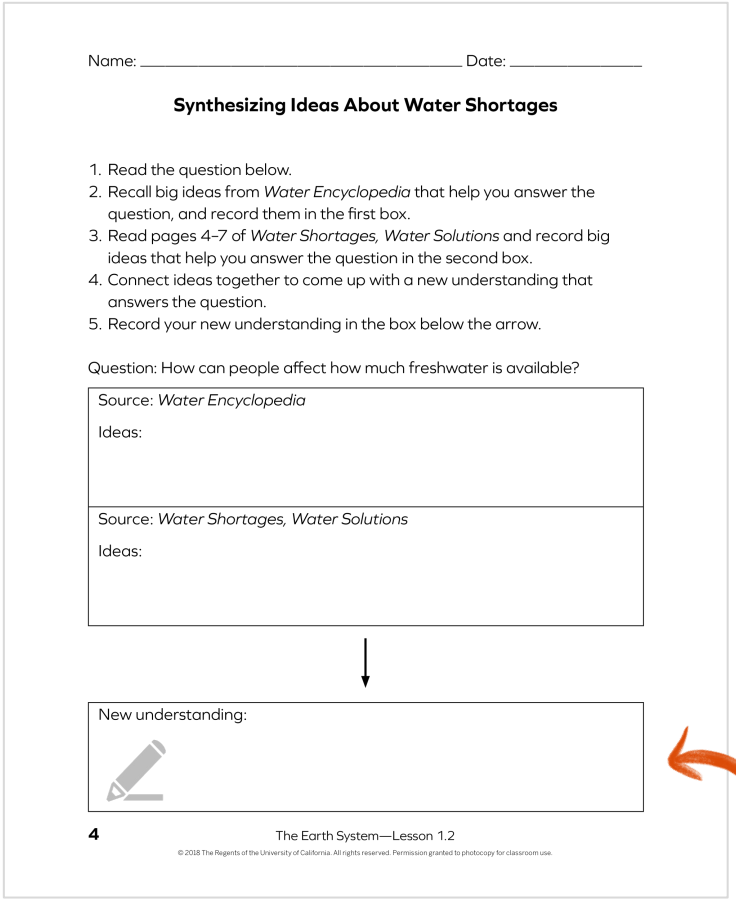
Question: How can people affect how much freshwater is available?

Source: *Water Encyclopedia* Ideas:
Source: *Water Shortages, Water Solutions* Ideas:

↓

New understanding:

Record a new understanding in your notebooks.



Name: _____ Date: _____

Synthesizing Ideas About Water Shortages

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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:

4 The Earth System—Lesson 1.2

What **new understanding** did you record?

Vocabulary

synthesize

to put together multiple pieces of information in order to understand something

Water is an important **resource** that people use every day.

People also rely on other **natural resources** like air, trees, and soil.

Why do you think air, trees, and soil are important **natural resources?**

We read about how people can affect water.

How could **human activities** affect natural resources like air, trees, and soil?

End of Lesson

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UNIVERSITY OF CALIFORNIA, BERKELEY

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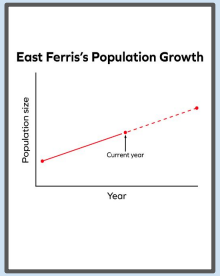
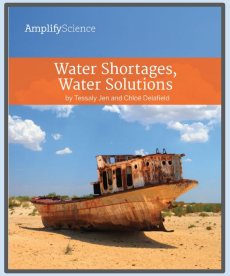
Gathering evidence

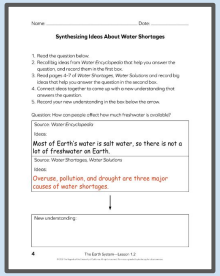
The Earth System , 1.2

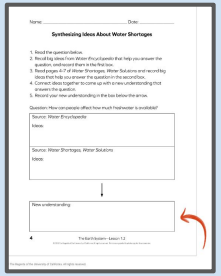
Why does West Ferris have more freshwater than East Ferris??

Where is water on Earth?







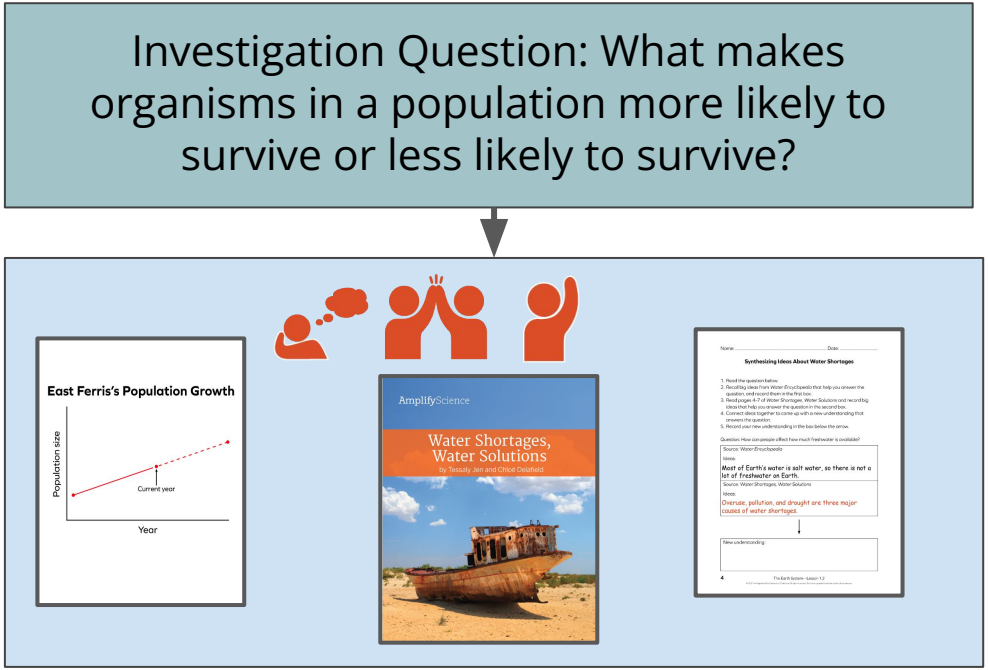


What have students figured out so far?

Evidence sources work together

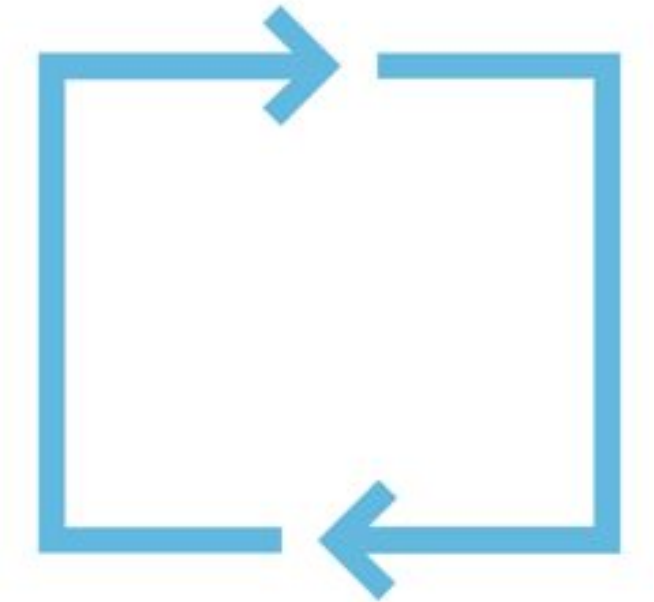
Investigating and discussing observations

How do these activities **work together** to support understanding of how different substances are different?



Multimodal learning

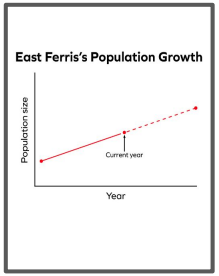
Gathering evidence over multiple lessons

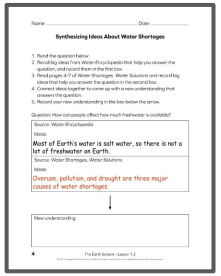


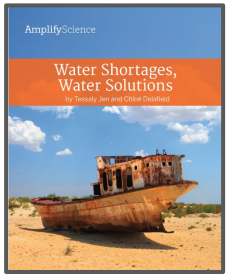
Do,
Talk,
Read,
Write,
Visualize

Evidence sources work together

Teacher tip: Every evidence source plays an important role in student learning. Be sure to teach every activity in order!







Coherence Flowchart

A diagram of student learning

Phenomenon
(Chapter Question)

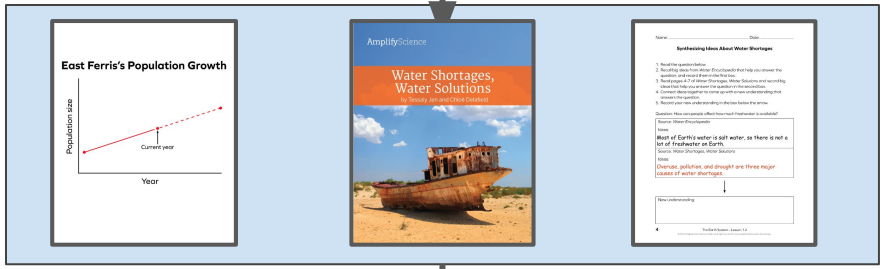
Investigation Question

Multiple sources of evidence

Key Concepts

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

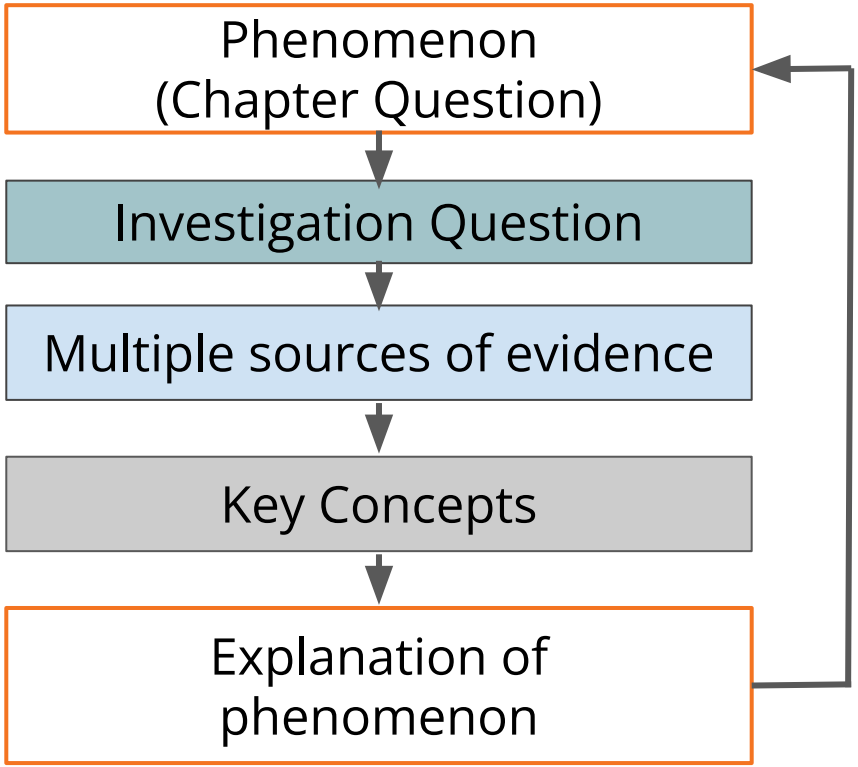
Investigation Question: Where is water on Earth?



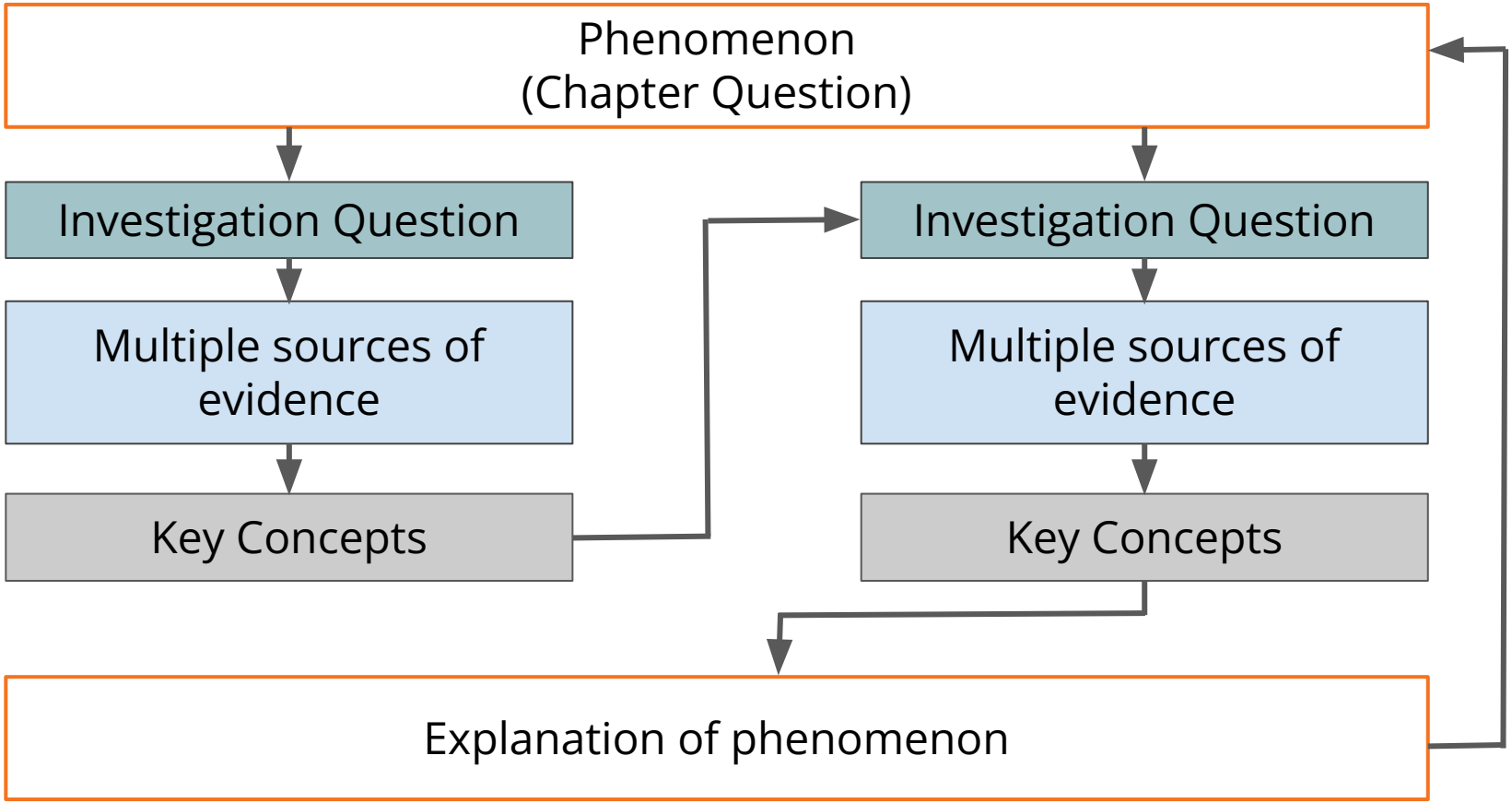
Students figure out: Almost all of Earth's water is salt water in the ocean. The limited amount of freshwater is mostly in glaciers and groundwater

Coherence Flowchart

A diagram of student learning



Coherence Flowchart



The Earth System: Investigating Water Shortages

Unit Anchor Phenomenon
Problem students work to solve

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

Chapter-level Anchor Phenomenon
Chapter 1 Question

East Ferris doesn't have enough water.
Why is East Ferris running out of water while West Ferris is not?

Investigation Questions

Where is water on Earth? (1.1)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

How can people affect how much freshwater is available? (1.2-1.3)
(Note: See Lesson Overviews for lesson-level Investigative Phenomena)

Evidence sources and reflection opportunities

- Investigate how much water there is on Earth through a globe tossing activity (1.1)
- Analyze graphs of global water distribution in Water Encyclopedia (1.1)

- Discuss how people use fresh water in their daily lives (1.2)
- Read *Water Shortages, Water Solutions* (1.2)
- Observe videos of of water flowing in and out of a reservoir at different rates (1.3)

Key concepts

- Almost all of Earth's water is salt water in the ocean. The limited amount of freshwater is mostly in glaciers and groundwater. (1.1)

- The amount of available freshwater decreases when people use more than the amount that flows into their area. (1.3)

Application of key concepts to the problem

- Analyze data about precipitation and population in East Ferris (1.3)
- In pairs, create diagrams showing why East Ferris is running out of water while West Ferris is not (1.3)
- Write a scientific explanation to answer the Chapter 1 Question (1.3)

Explanation that students can make to answer the Chapter 1 Question

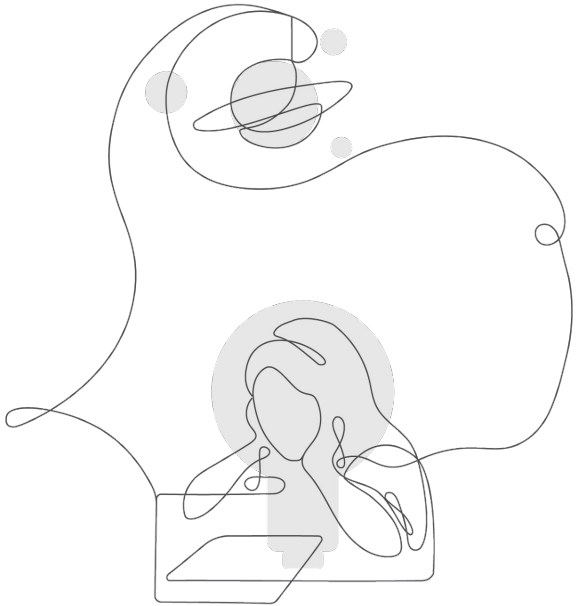
Ferris Island is surrounded by ocean, but salt water is unusable for most human purposes. East Ferris's growing population is using up their only freshwater source, a groundwater reservoir, whereas West Ferris has an additional source of freshwater—rain.

Amplify.

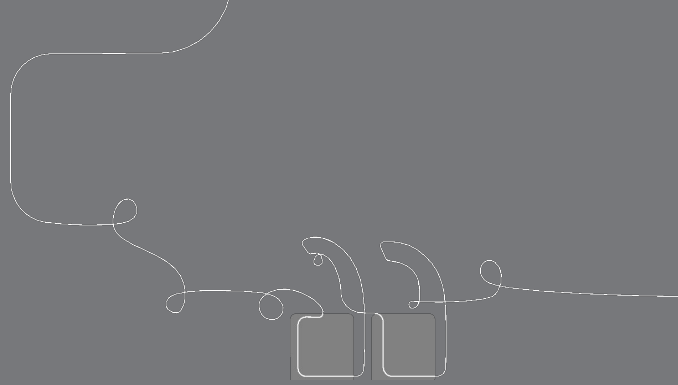
Explore the Coherence Flowchart

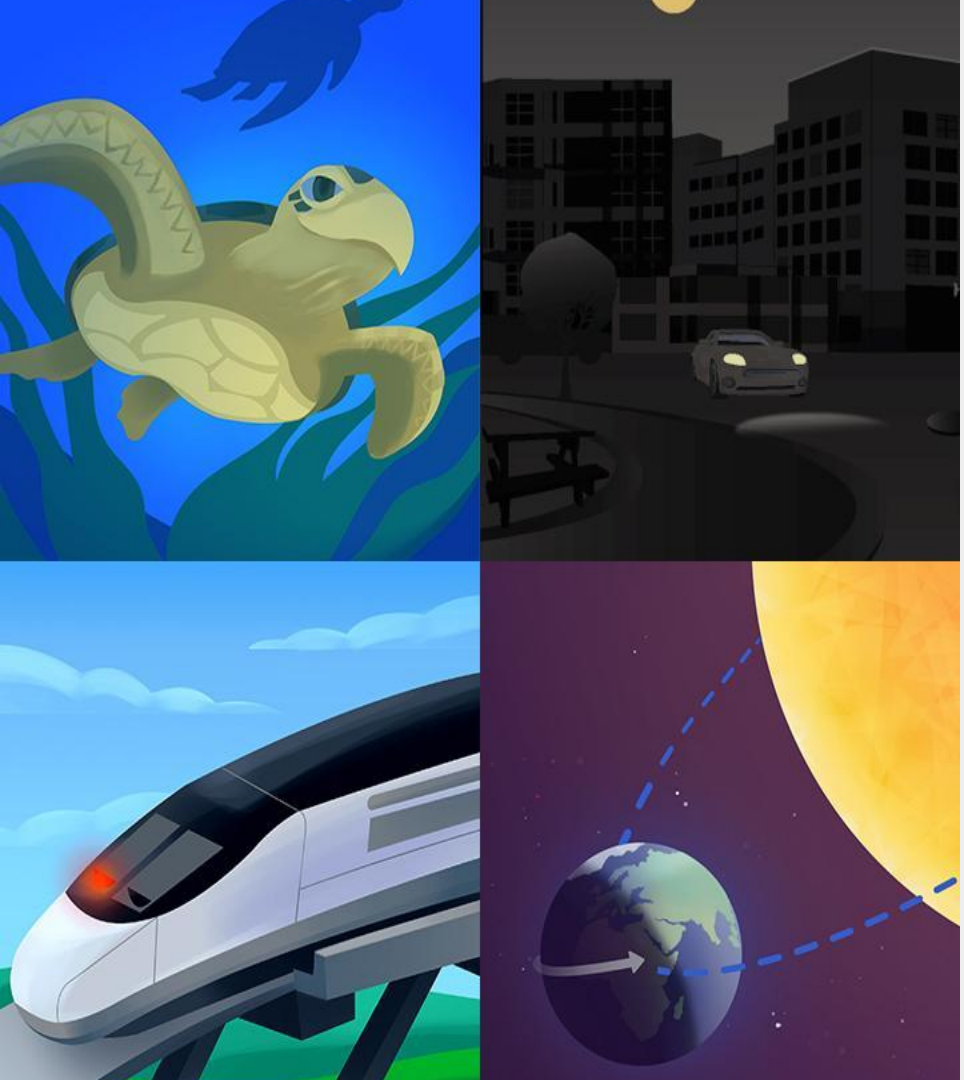
Skim the Chapter 1 Coherence Flowchart of your first unit.

How can the Coherence Flowchart serve you as a planning tool as you begin teaching Amplify Science?



Questions?

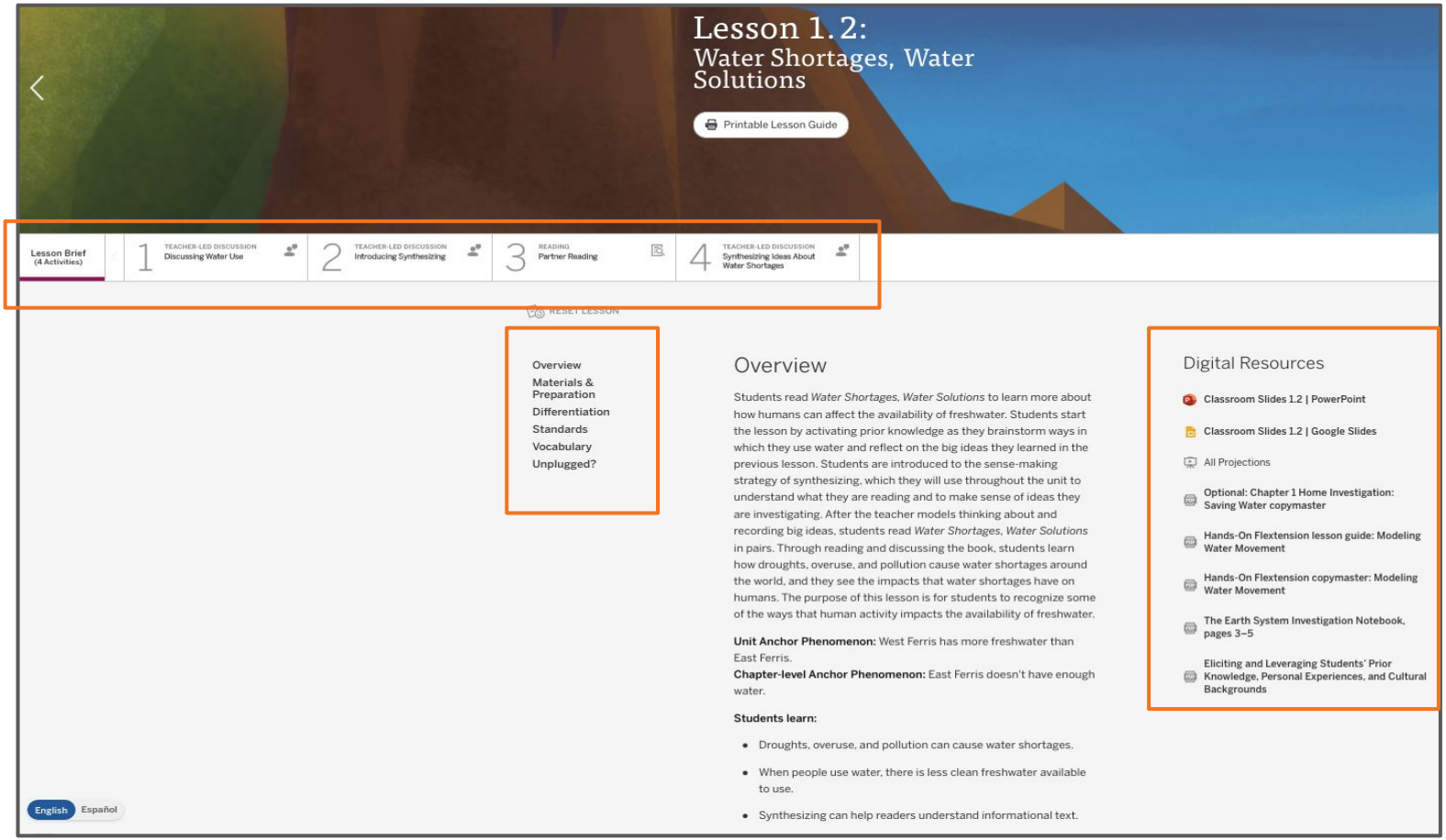




Plan for the day: Part 2

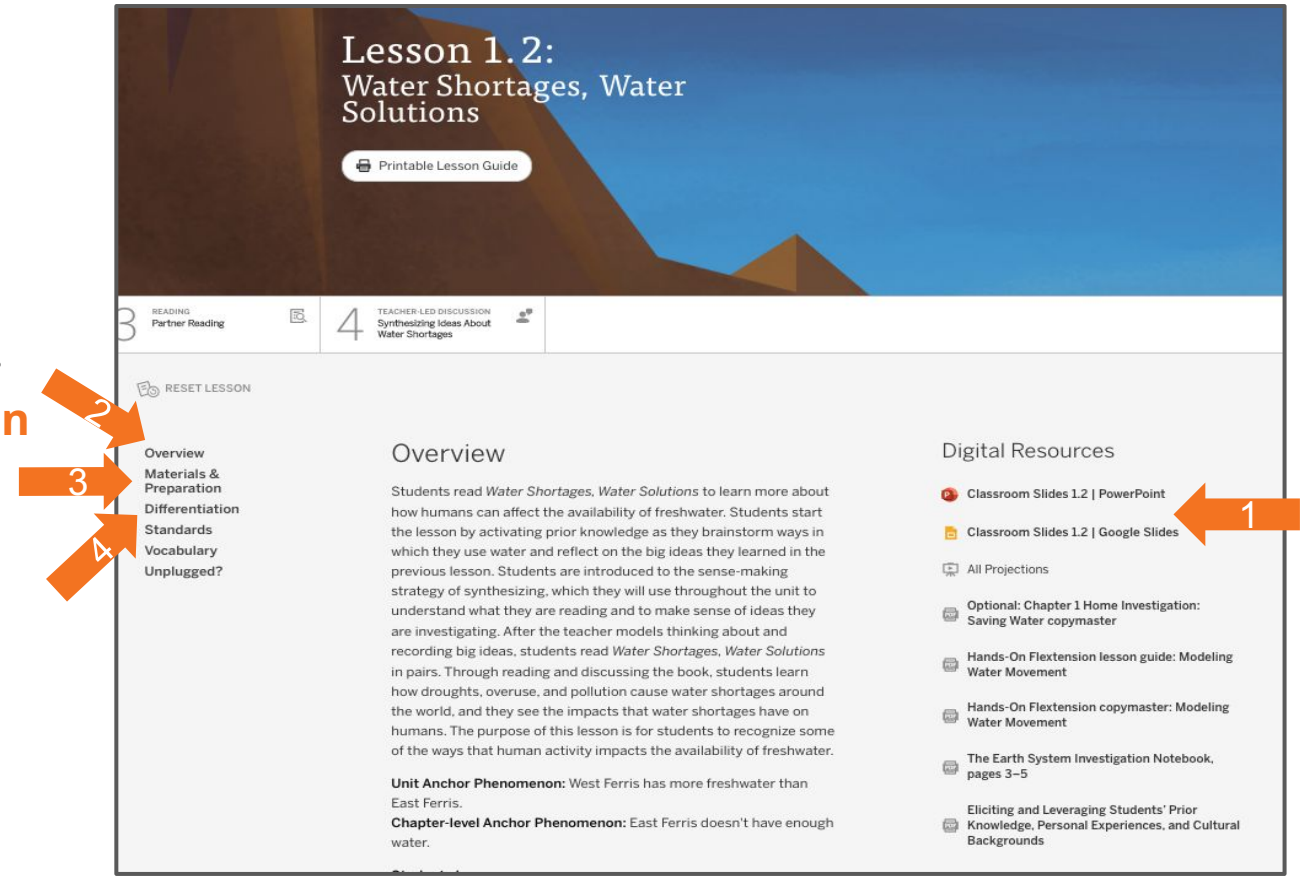
- Teaching and Learning in an Amplify Science Lesson
- Instructional Approach Reflection
- Planning a Lesson
- Closing

Navigate to the Lesson Brief



4 Steps for Starting Your Lesson

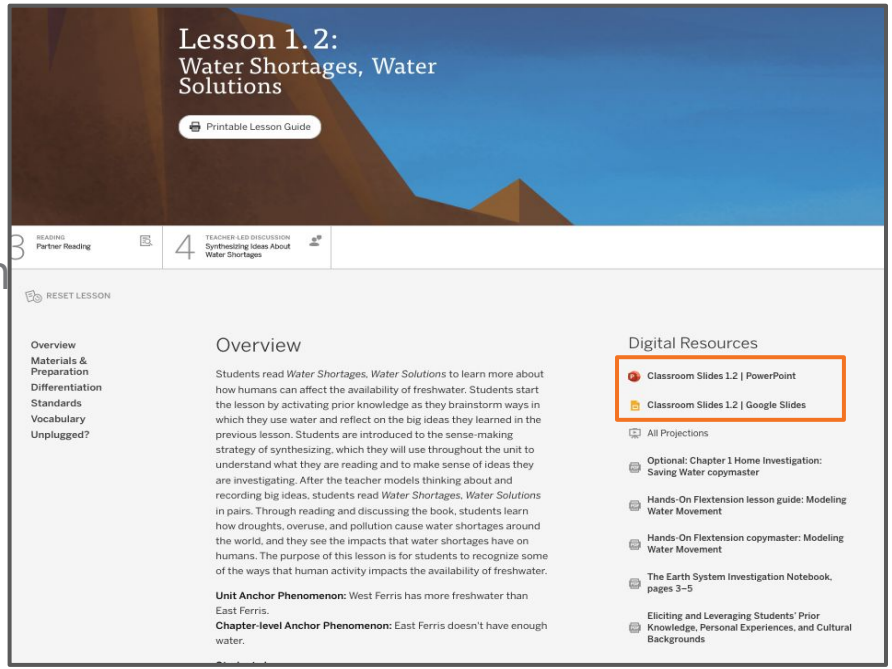
1. Download **Classroom Slides** and review them.
2. Read the **Overview**.
3. Review the **Materials & Preparation** document.
4. Read the **Differentiation** document.



Preparing to teach

Classroom Slides

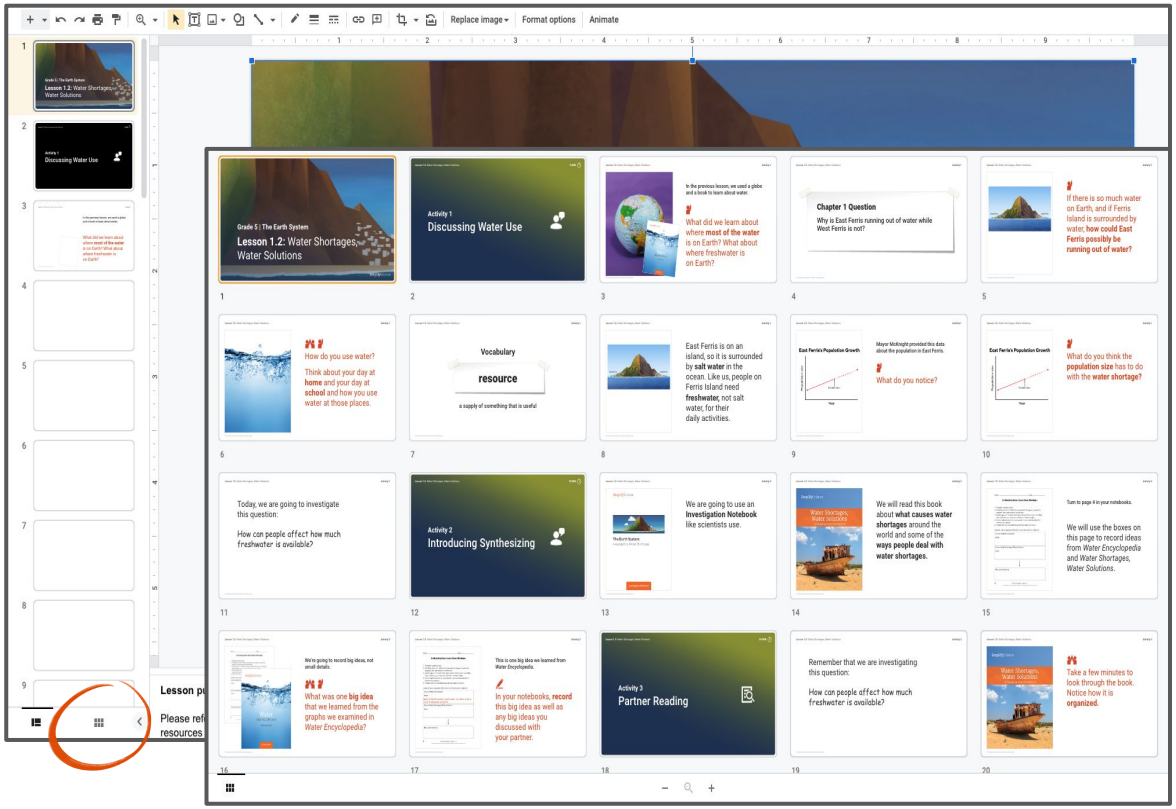
1. Open the **Classroom Slides** under the **Digital Resources**.
2. Read through the Classroom Slides including the **presenter notes** to gain a better understanding of the lesson.
3. **Consider:**
   - What features of the Classroom Slides will support you in teaching this lesson?



Using Classroom Slides as a planning tool

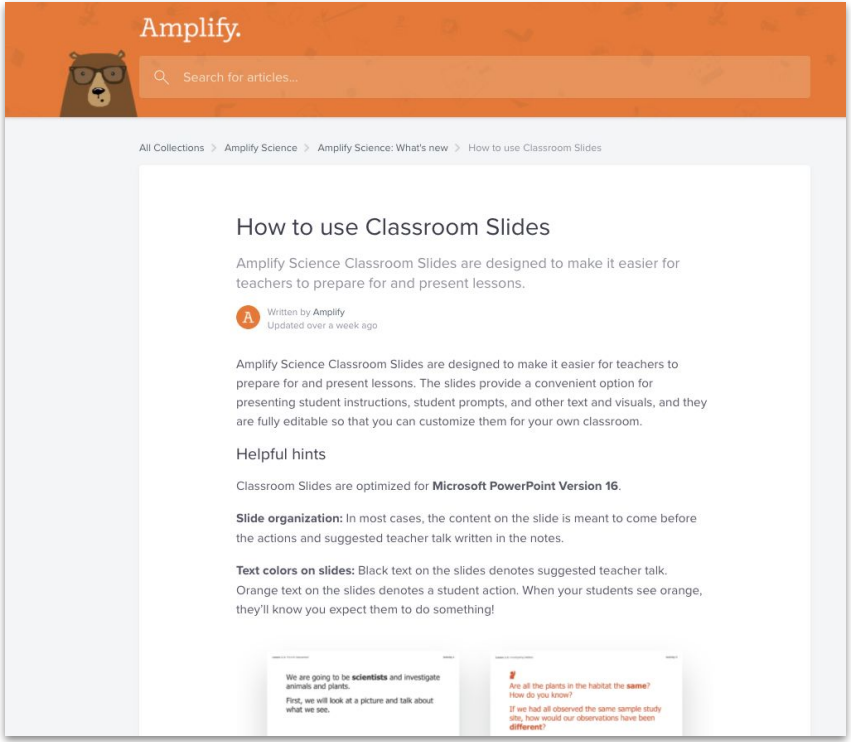
Teacher tip: Classroom Slides are a great visual summary of a lesson. Many teachers download and flip through a lesson's Classroom Slides deck to preview what happens in the lesson.

This is a useful first step for preparing to teach the lesson.



Teaching with Classroom Slides

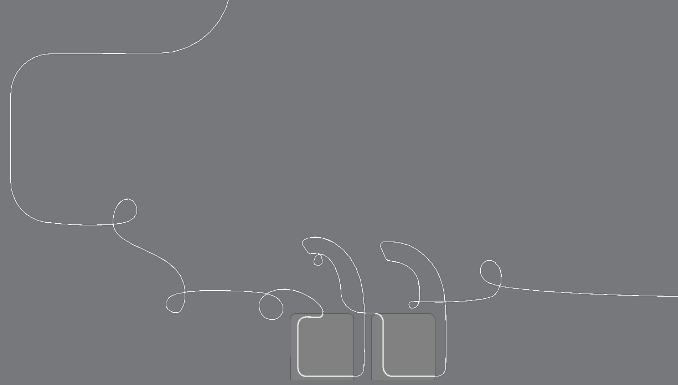
This detailed guide on the Amplify Science Help Site includes tips for teaching with Classroom Slides and information about the different symbols and activity types you'll find in the slide deck.

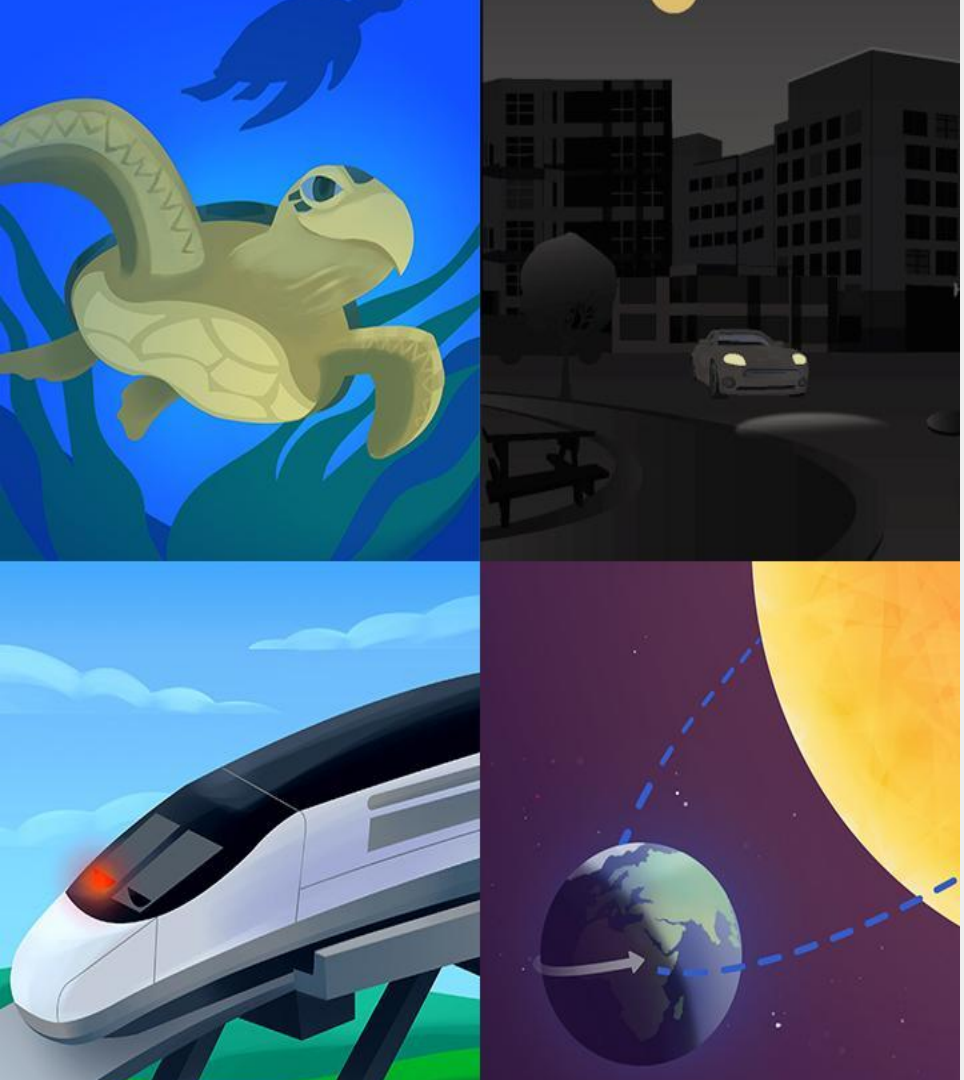


Lesson __	Activity Overview	From the Lesson at a glance in the overview
What is the purpose of this lesson? From the lesson overview	**Activity 1 (##min)**	
What will students learn?	**Activity 2 (##min)**	
3-D Statement (identify SEP, CCC, and DCI): From the lesson standards	**Activity 3 (##min)**	
Student Resources: From the lesson materials and preparation	**Activity 4 (##min)**	
Assessment Opportunities: From the lesson at a glance in the overview or classroom slides	**Activity 5 (##min)**	

Lesson 1.2	Activity Overview	
What is the purpose of this lesson? The purpose of this lesson is for students to recognize some of the ways that human activity impacts the availability of freshwater.	**Activity 1 (##min)**	Students discuss how people use freshwater in their everyday lives. (5 min)
What will students learn? • Droughts, overuse, and pollution can cause water shortages. • When people use water, there is less clean freshwater available to use. • Synthesizing can help readers understand informational text. • Science affects everyday life	**Activity 2 (##min)**	Introducing Synthesizing (15 min)
3-D Statement (identify SEP, CCC, and DCI): Students read the book *Water Shortages, Water Solutions* to obtain and evaluate information regarding how the actions of humans can change the availability of freshwater in a region (stability and change) in order to better define the problem of water availability in East Ferris.	**Activity 3 (##min)**	Partner Reading (25 min)
Student Resources: *Water Shortages, Water Solutions*, Investigation Notebooks	**Activity 4 (## min)**	Synthesizing Ideas about Water Shortages (15 min)
Assessment Opportunities: On-the-Fly Assessment	**Activity 5 (##min)**	

Questions?





Plan for the day: Part 2

- Teaching and Learning in an Amplify Science Lesson
- Instructional Approach Reflection
- Planning a Lesson
- Closing

Additional resources

Welcome, caregivers!

—

We hope you enjoy learning more about Amplify Science and what students are learning in science this year.

Para acceder a este sitio en español haga clic aquí.

Amplify welcomes you and your learner to the Science program for the new school year. We are very excited to

TOP RATED BY EDREPORTS

Grades 6-8

[Caregivers]

LAUSD Microsite- https://amplify.com/lausd-science

Welcome to Amplify Science!

This site contains supporting resources designed for the LAUSD Amplify Science adoption for grades TK–8.

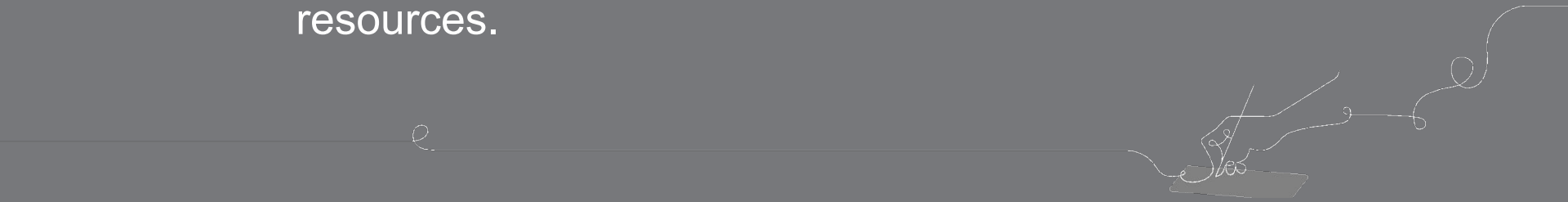
- Access the Amplify Science Program Hub (To help orient you to the new design, watch this video and view this reference guide.)
- Find out more about Amplify Science@Home
- Share the Caregiver Hub (Eng/Span) with your families
- For LAUSD ES Teachers- Amplify Science & Benchmark Advance Crosswalk
- Instructional guidance for a Responsive Relaunch of Amplify Science in 21-22

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

Overarching goals

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

- ✓ Describe what teaching and learning look like in Amplify Science.
- ✓ Prepare to teach using Amplify Science resources.



Closing reflection

Based on our work today in Part 2, share:

Head: something you'll keep in mind

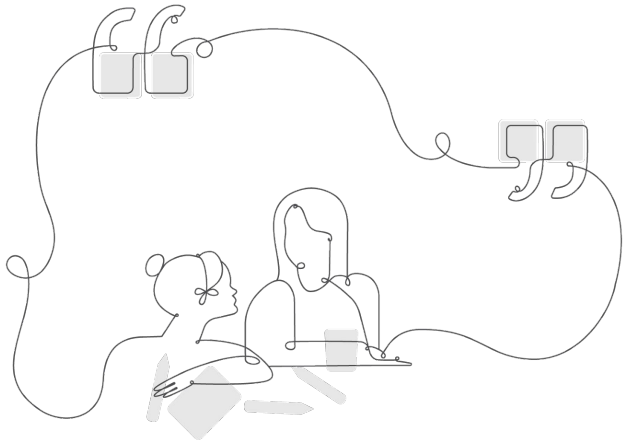
Heart: something you're feeling

Feet: something you're planning to do

Onsite Upcoming Professional Development!

Part 3: Unit 3- Writing in Science

- January 28, 2023 (grades 3-6 + TK)



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

Please provide feedback!

Presenter name:

Workshop title:

Part 1: Unit 3 Internalization

Part 2: Guided Planning (Planning for a Lesson)

Modality:

Remote