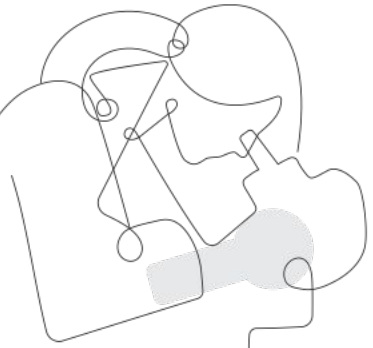
Do Now: *Use the link in the chat to add your best remote learning tips and tricks for teaching Amplify Science to the Jamboard.*

Amplify Science

Unit Internalization & Guided Planning

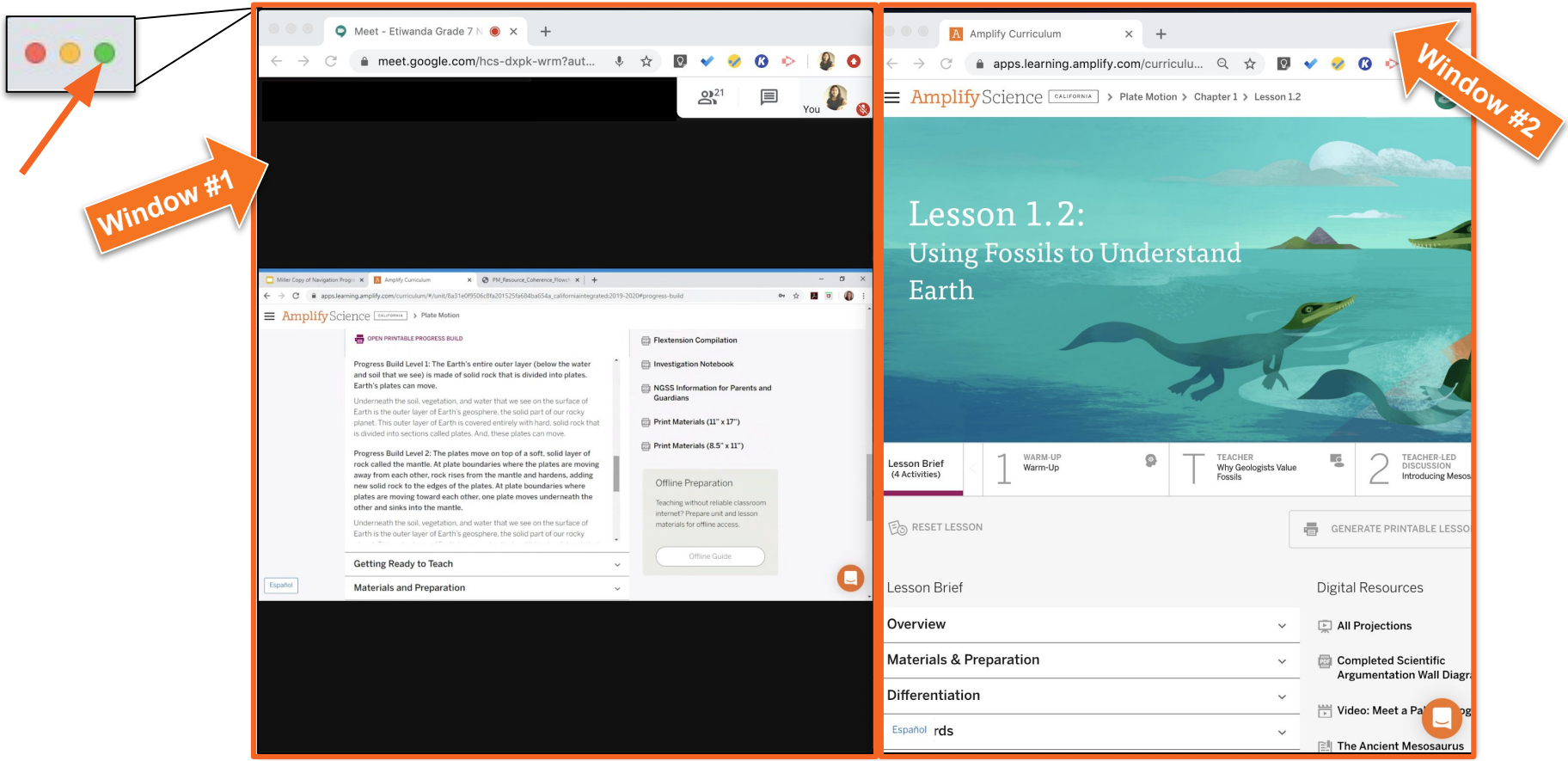
Deep-dive and strengthening workshop
Grade 8, Natural Selection



LAUSD
3/6/2021
Presented by Your Name

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

Use two windows for today's webinar



Norms: Establishing a Culture of Learners

- Please keep your camera on, if possible.
- Take some time to orient yourself to the platform
  - *“where’s the chat box? what are these squares at the top of my screen?, where’s the mute button?”*

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

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

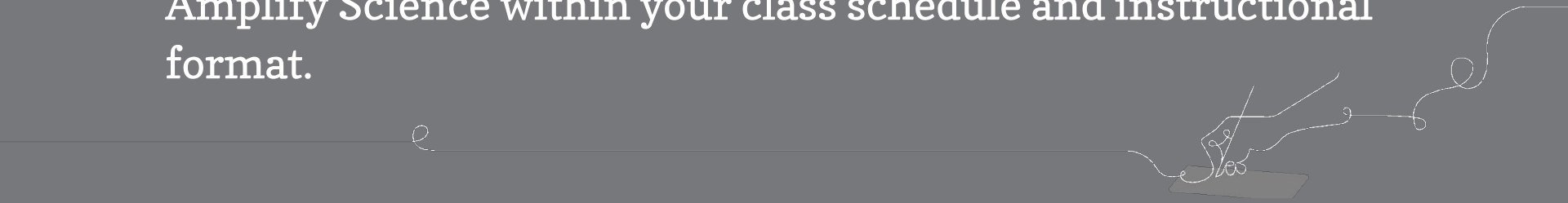
- Make sure you have a note-catcher present

- Be an active participant - chat, ask questions, discuss, share!

Workshop goals

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

- Internalize your upcoming unit.
- Plan for collecting **evidence of student learning** in order to make instructional decisions to **support diverse learner needs**.
- Gather resources to develop a multi-day plan for implementing Amplify Science within your class schedule and instructional format.



Plan for the day

- Framing the day
  - Welcome
  - Instructional Materials
- Unit Internalization
- Planning to teach
  - Collecting evidence of student learning to meet diverse learner needs
- Reflection and closing

Plan for the day

- **Framing the day**
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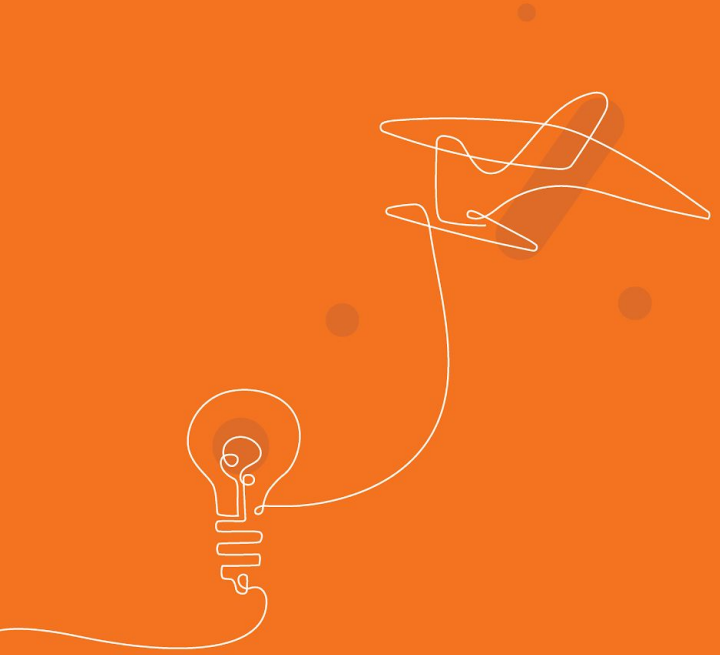
  - **Instructional Materials**
- Unit Internalization
- Planning to teach
  - Collecting evidence of student learning to meet diverse learner needs
- Reflection and closing



Amplify Science Refresher

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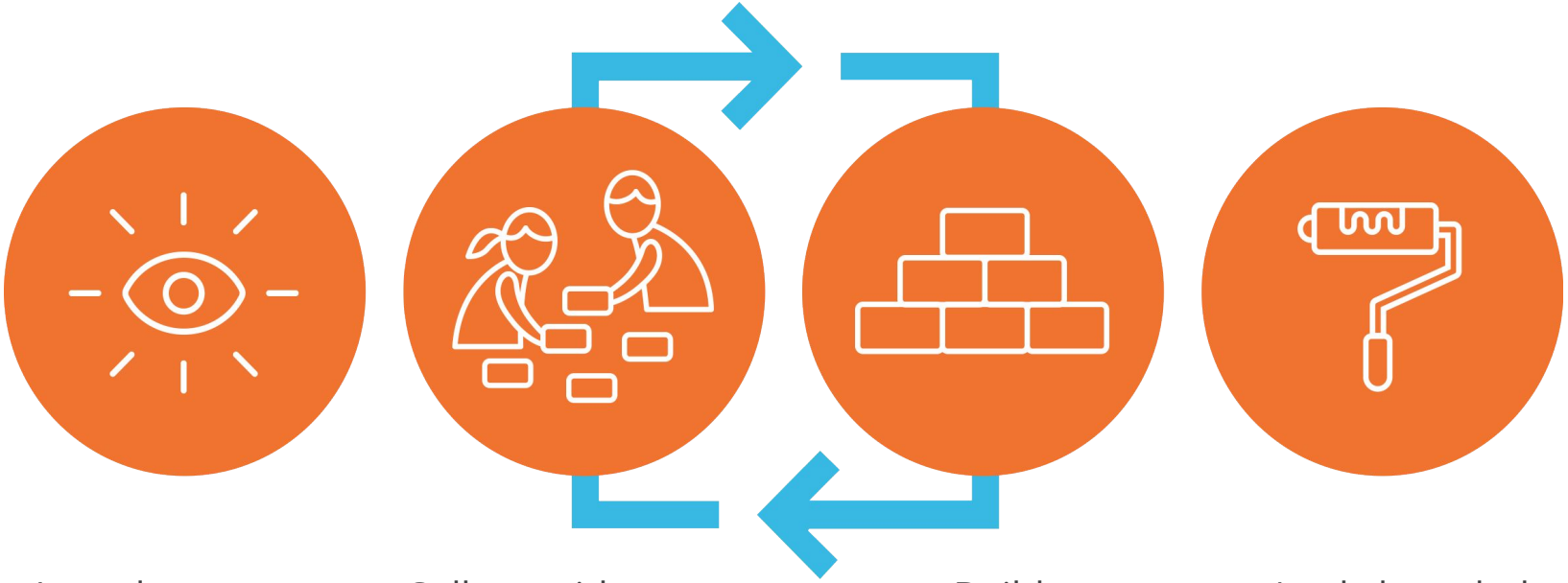
Amplify Science Instructional Approach

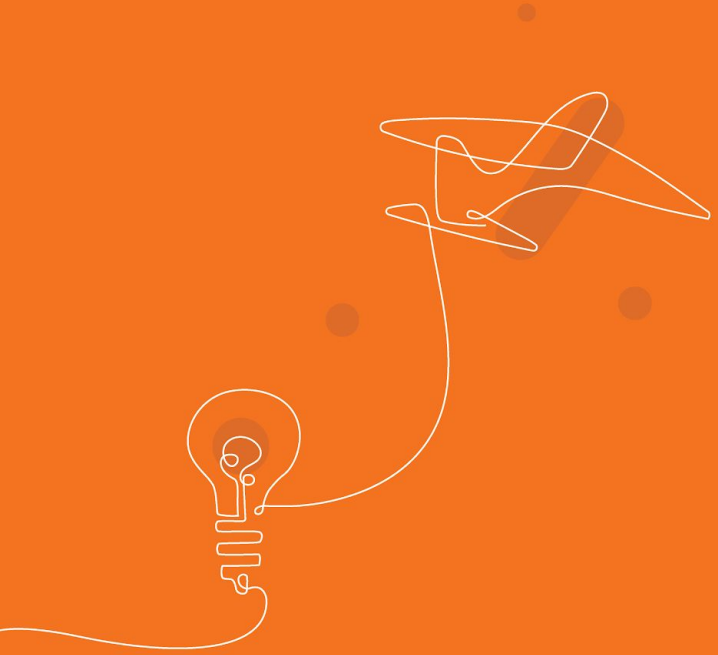


Introduce a phenomenon and a related problem

Collect evidence from multiple sources

Build increasingly complex explanations

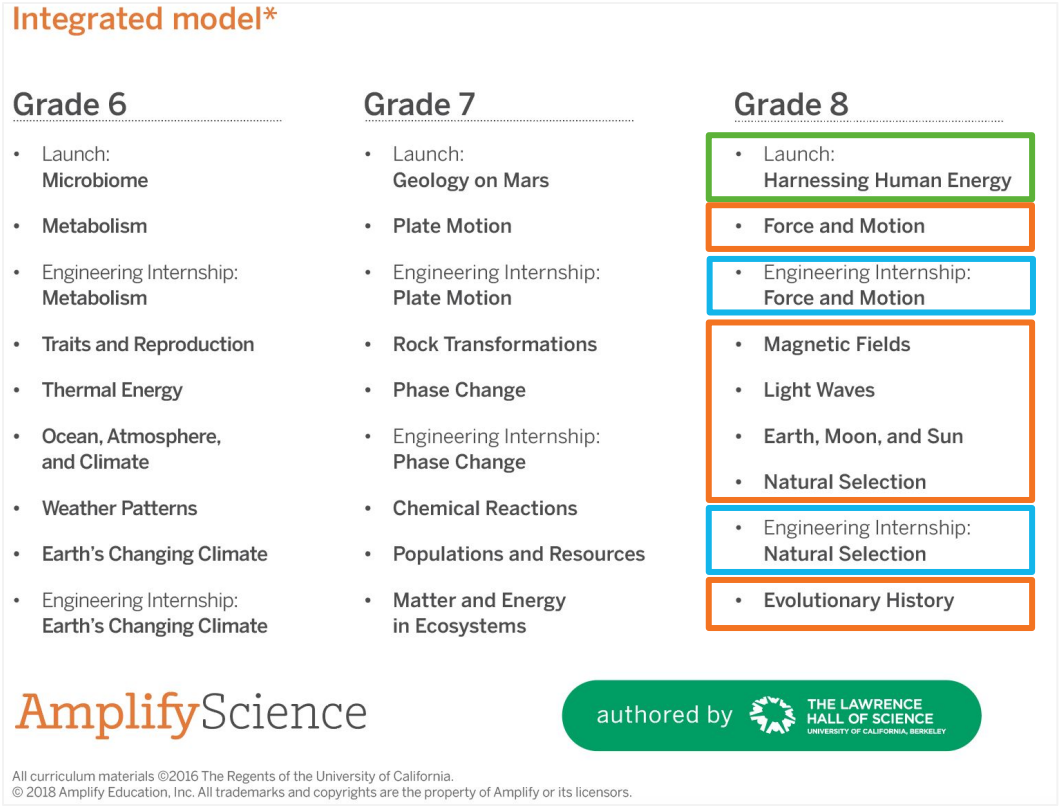
Apply knowledge to solve a different problem



Instructional Materials

Amplify.

Middle school course curriculum structure



Launch unit

- First unit
- 11 lessons

Core units

- Majority of units
- 19 lessons

Engineering Internships

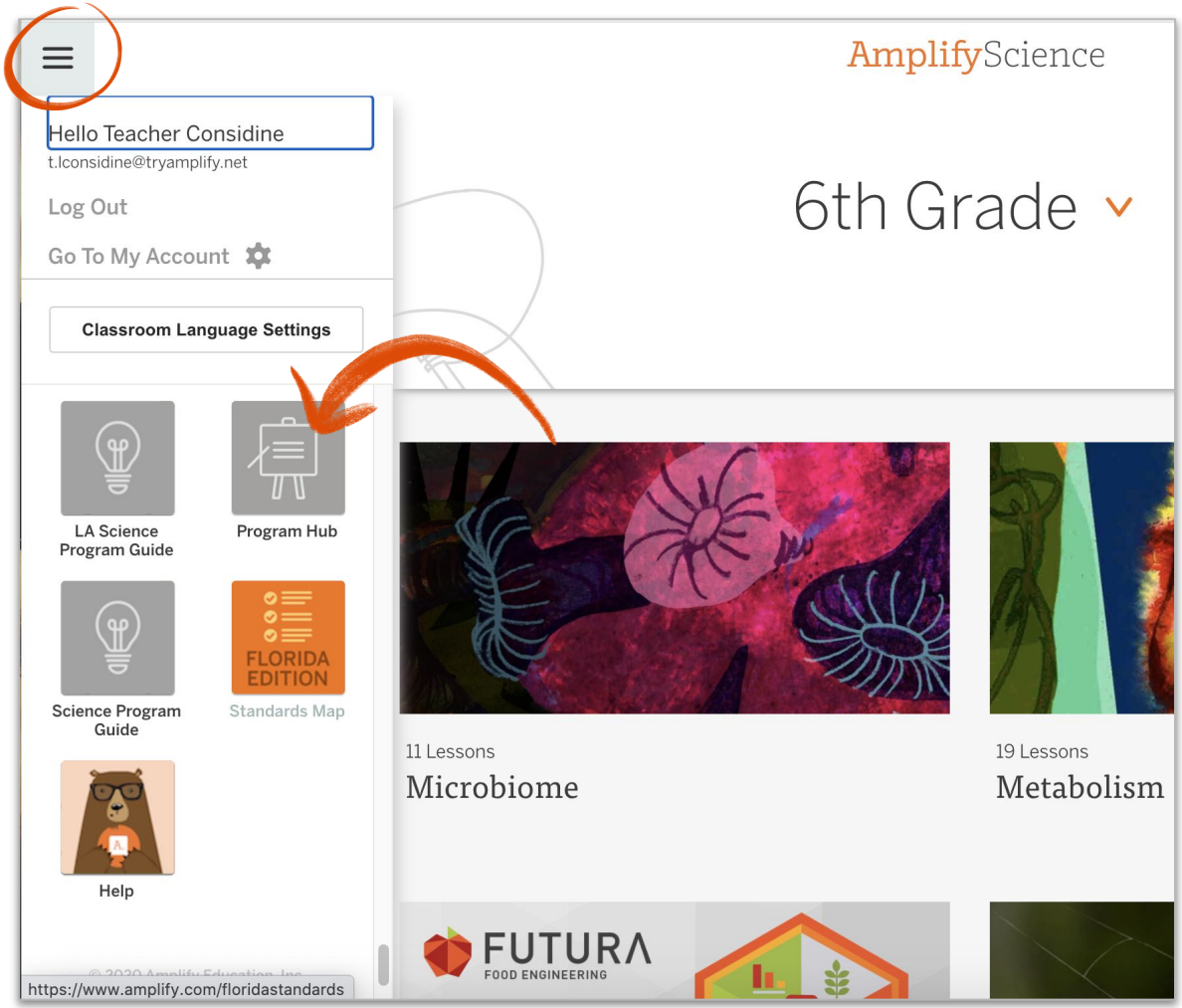
- Two per year
- 10 lessons

Standard Amplify Science Curriculum

Amplify Science @Home Curriculum

Amplify Science @Home Curriculum

In addition to the standard Amplify Science curriculum, you also have access to Amplify Science @Home Curriculum on the Science Program Hub.



AmplifyScience@Home

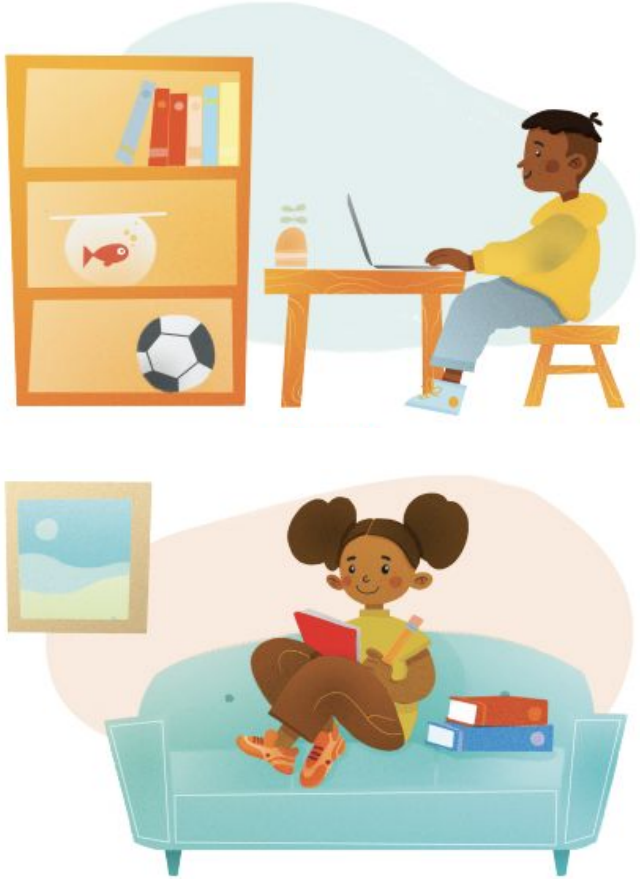
Two different options:

@Home Units

- Digital or print-based versions of Amplify Science units condensed by about 50%

@Home Videos

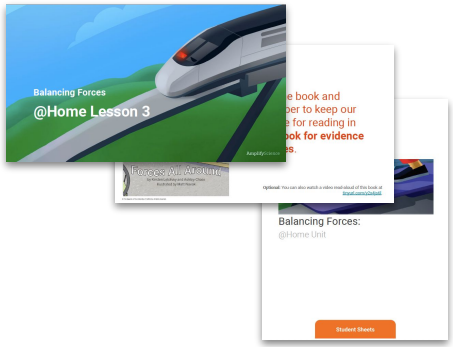
- Video playlists of Amplify Science lessons, taught by real Amplify Science teachers



@Home Units

A shift in approach to respond to user feedback

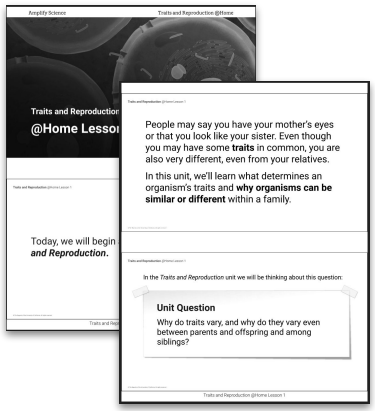
Original approach: two different resources

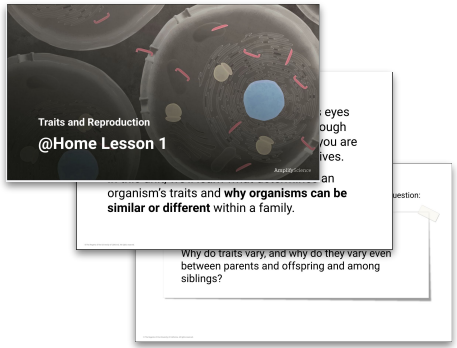


Print-based: @Home packets

Digital: @Home slides and student sheets

Updated approach: one resource, two formats





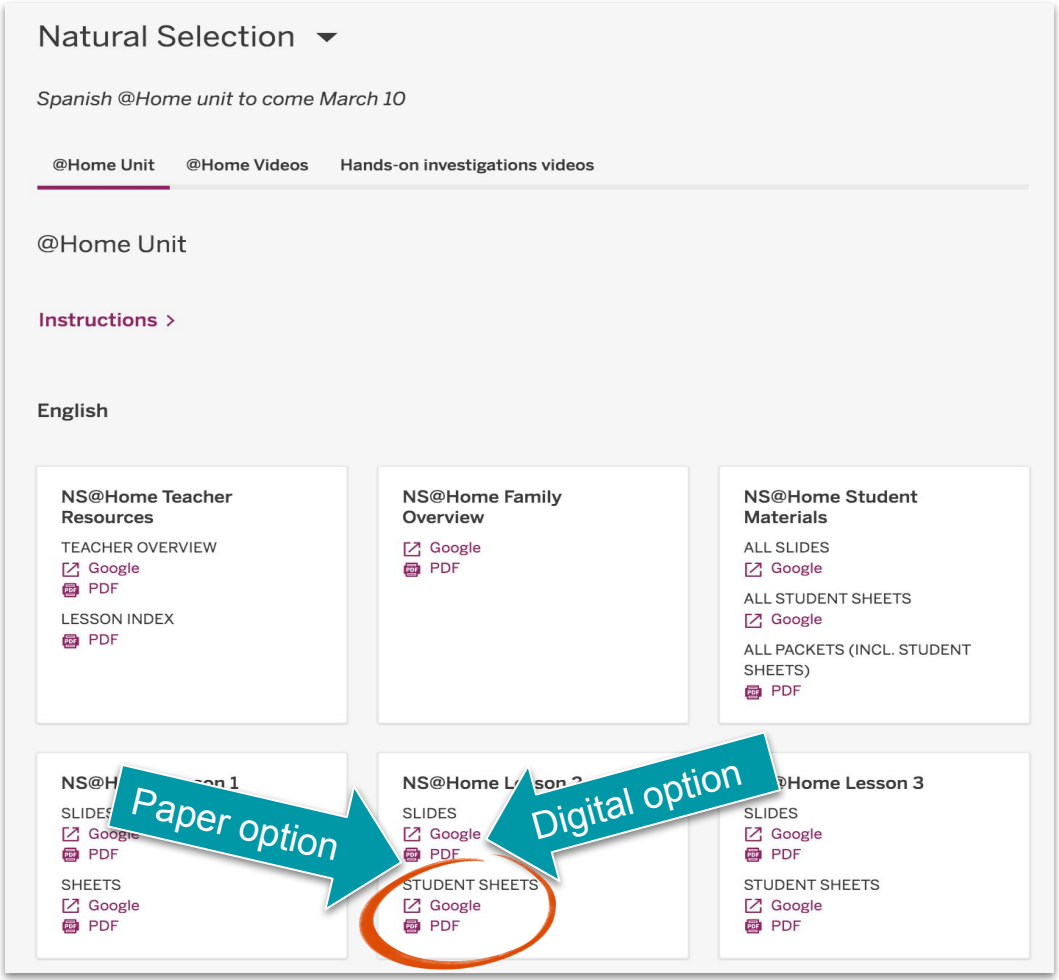
Print-based: PDFs of @Home Slides and student sheets

Digital: Google Slides @Home Slides and Google Doc student sheets

Amplify Science @Home Curriculum

You have access to the Natural Selection @Home Unit.

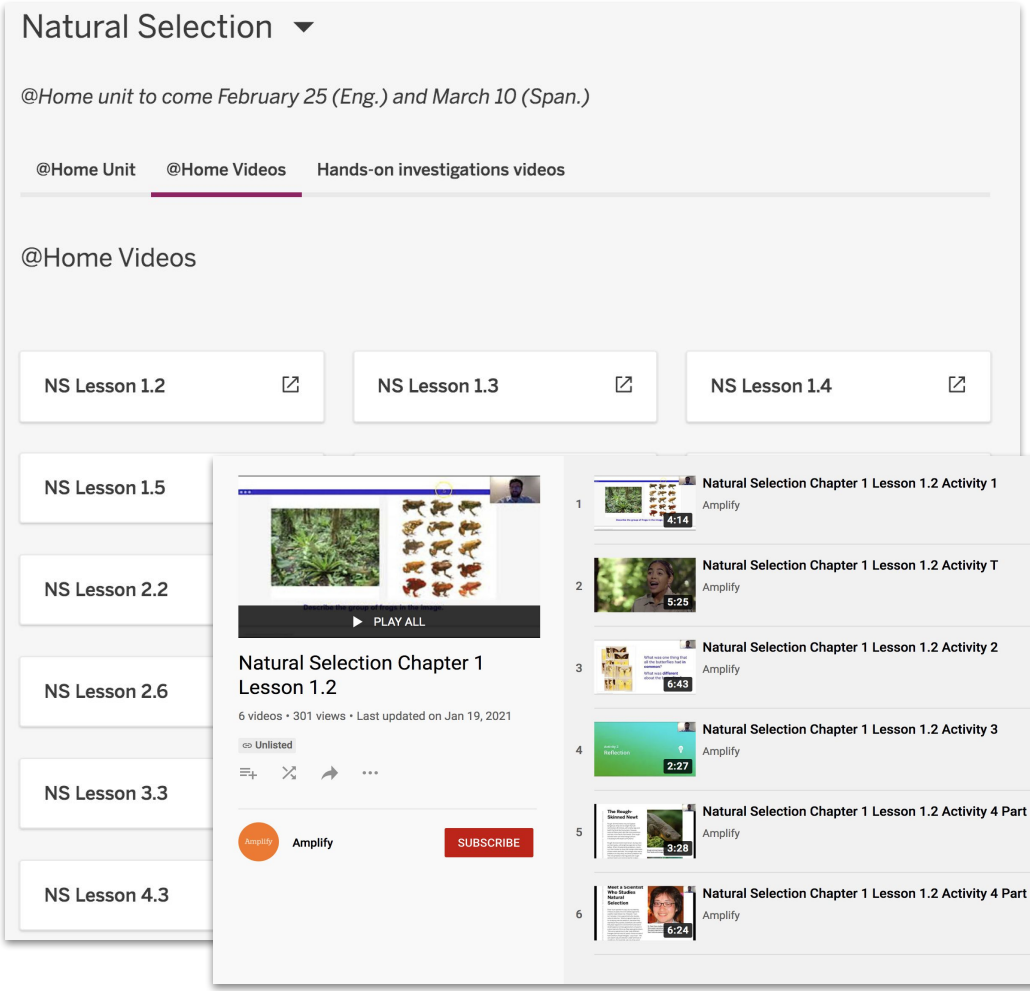
The Natural Selection @Home Unit has **14 lessons.** Each lesson is written to be **30 minutes** long.

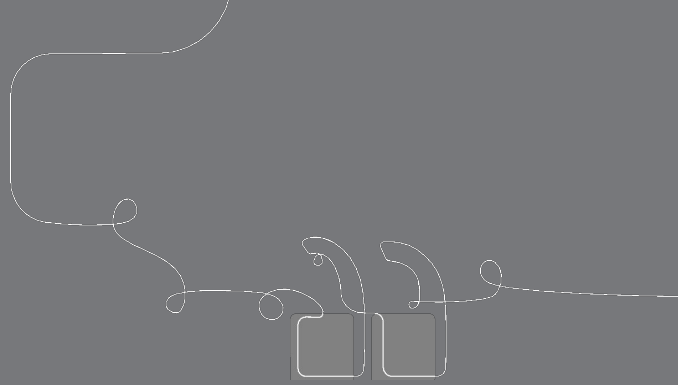


Amplify Science @Home Curriculum

You have access to the Natural Selection @Home Videos.

There are 16 @Home Videos for the Natural Selection unit. This covers all lessons expect for the assessment lessons (1.1, 2.5, and 4.4). The video playlists on YouTube teach the standard Amplify Science Lessons.





Questions?

Plan for the day

- Framing the day
  - Welcome
  - Instructional Materials
- **Unit Internalization**
- Planning to teach
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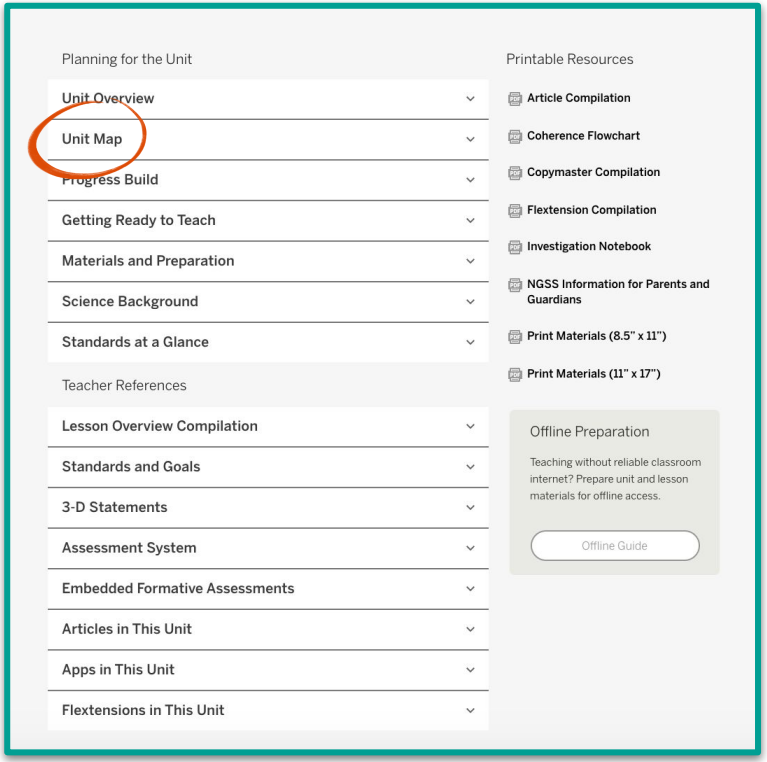
- Reflection and closing

Unit Guide Resources



Unit Guide resources

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

Planning for the unit

Unit Overview	Describes what's in each unit, the rationale, and how students learn across chapters
Unit Map	Provides an overview of what students figure out in each chapter, and how they figure it out
Progress Build	Explains the learning progression of ideas students figure out in the unit
Getting Ready to Teach	Provides tips for effectively preparing to teach and teaching the unit in your classroom
Materials and Preparation	Lists materials included in the unit's kit, items to be provided by the teacher, and briefly outlines preparation requirements for each lesson
Science Background	Adult-level primer on the science content students figure out in the unit
Standards at a Glance	Lists Next Generation Science Standards (NGSS) (Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts), Common Core State Standards for English Language Arts, and Common Core State Standards for Mathematics

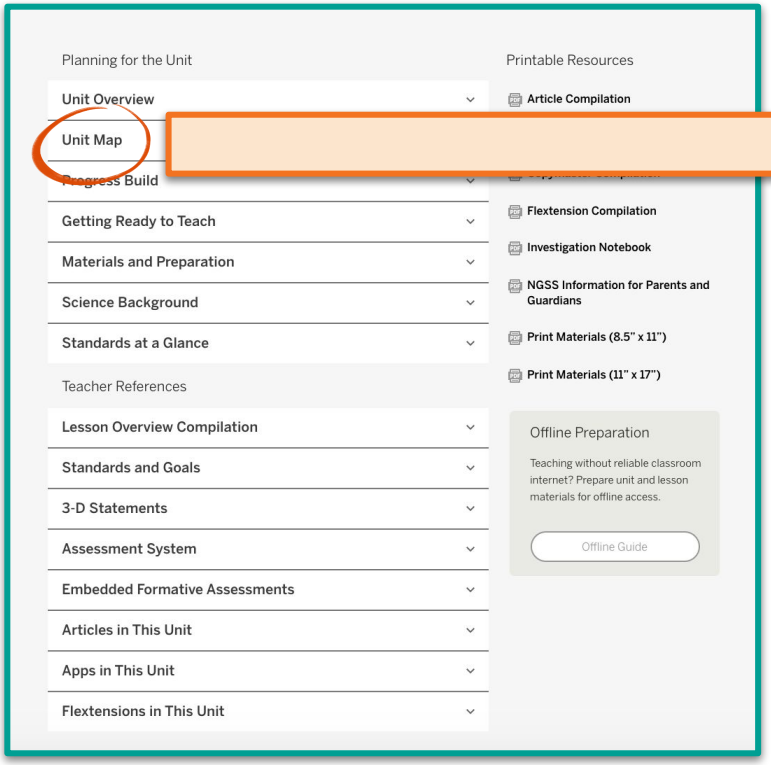
Teacher references

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

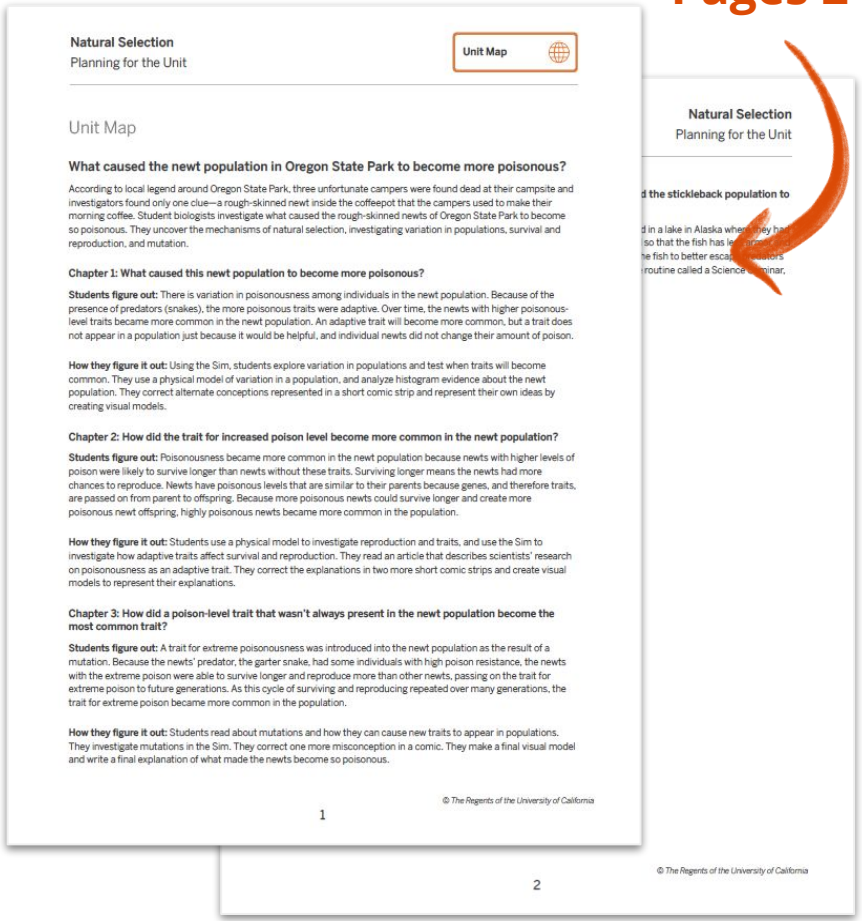
Printable resources

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

Unit Map



Pages 2-3



Natural Selection
Planning for the Unit

Unit Map

What caused the newt population in Oregon State Park to become more poisonous?

According to local legend around Oregon State Park, three unfortunate campers were found dead at their campsite and investigators found only one clue—a rough-skinned newt inside the coffeepot that the campers used to make their morning coffee. Student biologists investigate what caused the rough-skinned newts of Oregon State Park to become so poisonous. They uncover the mechanisms of natural selection, investigating variation in populations, survival and reproduction, and mutation.

Chapter 1: What caused this newt population to become more poisonous?

Students figure out: There is variation in poisonousness among individuals in the newt population. Because of the presence of predators (snakes), the more poisonous traits were adaptive. Over time, the newts with higher poisonous-level traits became more common in the newt population. An adaptive trait will become more common, but a trait does not appear in a population just because it would be helpful, and individual newts did not change their amount of poison.

How they figure it out: Using the Sim, students explore variation in populations and test when traits will become common. They use a physical model of variation in a population, and analyze histogram evidence about the newt population. They correct alternate conceptions represented in a short comic strip and represent their own ideas by creating visual models.

Chapter 2: How did the trait for increased poison level become more common in the newt population?

Students figure out: Poisonousness became more common in the newt population because newts with higher levels of poison were likely to survive longer than newts without these traits. Surviving longer means the newts had more chances to reproduce. Newts have poisonous levels that are similar to their parents because genes, and therefore traits, are passed on from parent to offspring. Because more poisonous newts could survive longer and create more poisonous newt offspring, highly poisonous newts became more common in the population.

How they figure it out: Students use a physical model to investigate reproduction and traits, and use the Sim to investigate how adaptive traits affect survival and reproduction. They read an article that describes scientists' research on poisonousness as an adaptive trait. They correct the explanations in two more short comic strips and create visual models to represent their explanations.

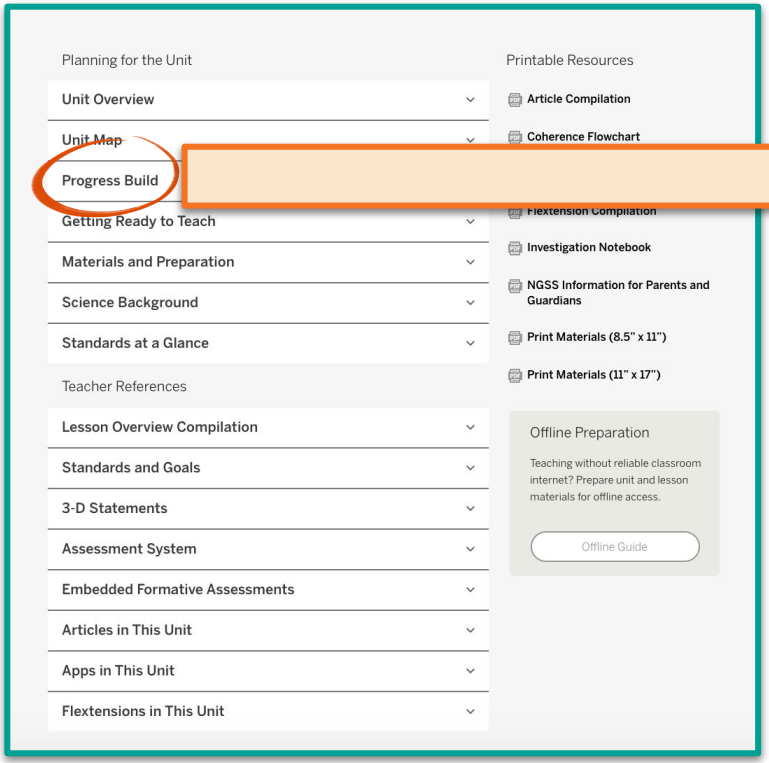
Chapter 3: How did a poison-level trait that wasn't always present in the newt population become the most common trait?

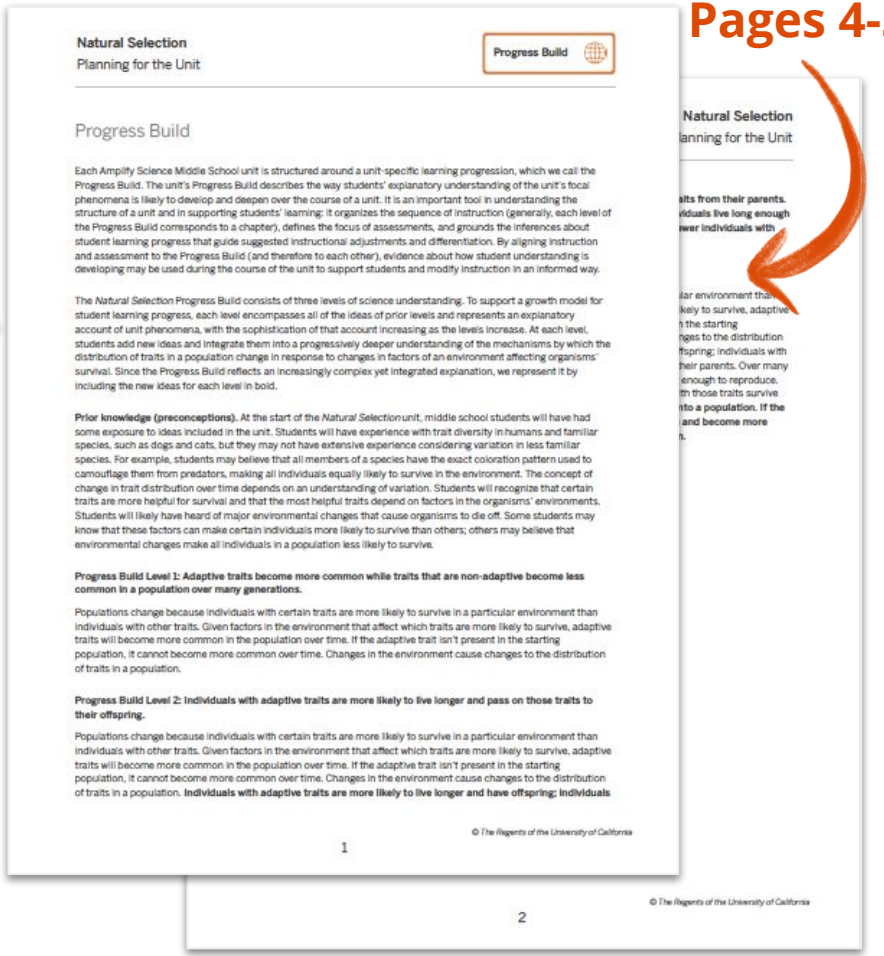
Students figure out: A trait for extreme poisonousness was introduced into the newt population as the result of a mutation. Because the newts' predator, the garter snake, had some individuals with high poison resistance, the newts with the extreme poison were able to survive longer and reproduce more than other newts, passing on the trait for extreme poison to future generations. As this cycle of surviving and reproducing repeated over many generations, the trait for extreme poison became more common in the population.

How they figure it out: Students read about mutations and how they can cause new traits to appear in populations. They investigate mutations in the Sim. They correct one more misconception in a comic. They make a final visual model and write a final explanation of what made the newts become so poisonous.

Natural Selection
Planning for the Unit

Progress Build





Pages 4-5

Amplify.

Unit Internalization Work Time

Pages 2-5

Guided Unit Internalization

Part 1: Unit-level internalization

Unit title:

What is the phenomenon students are investigating in your unit?

Unit Question:

Student role:

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

What science ideas do students need to figure out in order to explain the phenomenon?

Page 6

Natural Selection
Planning for the Unit

Unit Map

Unit Map

What caused the newt population in Oregon State Park to become more poisonous?

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1

2

1

2

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Unit Guide Document

Unit Map

Lesson Overview Compilation

Unit Map

Progress Buld

Guided Unit Internalization

Part 1: Unit-level internalization

Unit title: Natural Selection

What is the phenomenon students are investigating in your unit?

What caused the rough-skinned newts of Oregon State Park to become so poisonous?

Unit Question:

Why do populations change over time?

Student role:

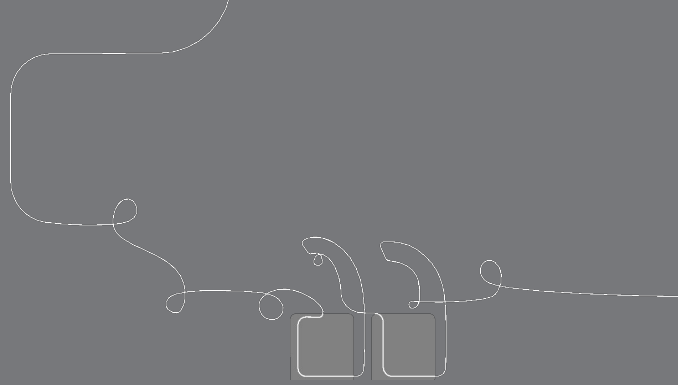
Student biologists

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

A trait for extreme poisonousness was introduced into the newt population as the result of a mutation. Because the newts' predator, the garter snake, had some individuals with high poison resistance, the newts with the extreme poison were able to survive longer and reproduce more than other newts, passing on the trait for extreme poison to future generations. As this cycle of surviving and reproducing repeated over many generations, the trait for extreme poison became more common in the population.

What science ideas do students need to figure out in order to explain the phenomenon?

Adaptive traits become more common while traits that are non-adaptive become less common in a population over many generations. Individuals with adaptive traits are more likely to live longer and pass on those traits to their offspring. Mutations can sometimes introduce new traits into a population.



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  - Welcome
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- Unit Internalization
- **Planning to teach**
  - **Collecting evidence of student learning to meet diverse learner needs**
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Page 2

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Chapter 1: Environmental Change and Trait Distribution

JUMP DOWN TO CHAPTER OVERVIEW

Lesson 1.1:
Pre-Unit Assessment

SETTINGS

Lesson 1.2:
The Mystery of the Poisonous Newts

Lesson 1.3:
Exploring Variation and Distribution in Populations

Lesson 1.4:
Investigating Changes in Trait Distribution

Lesson 1.5:
Adaptive Traits

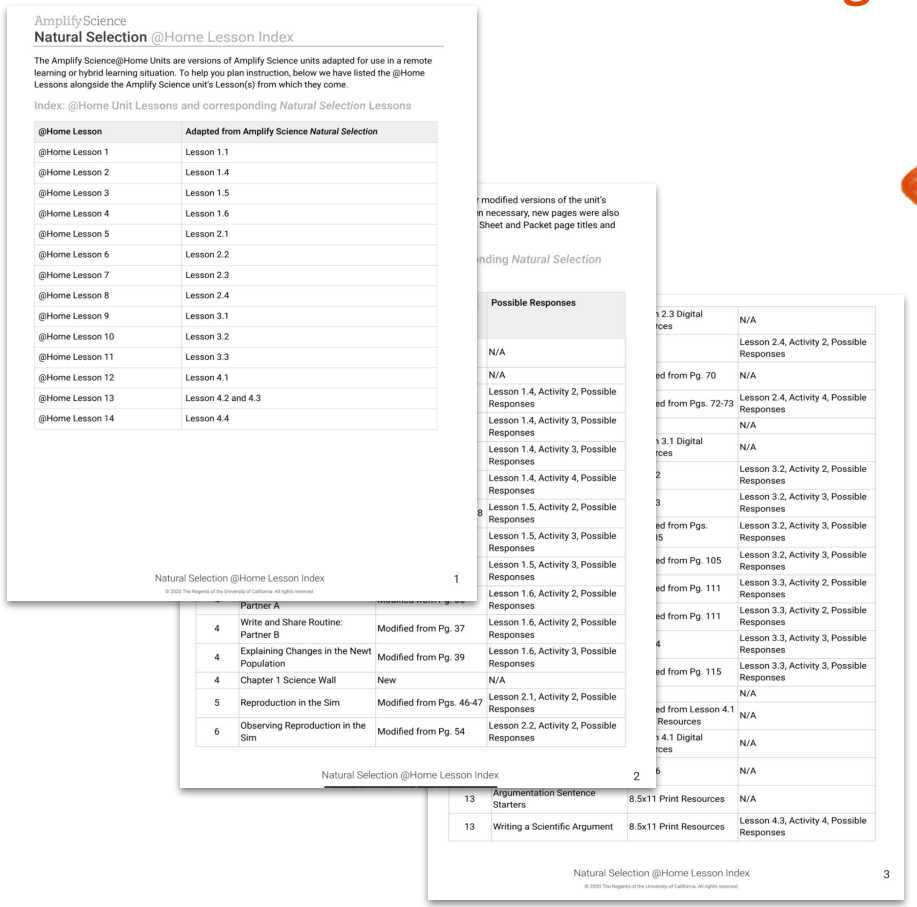
Lesson 1.6:
Explaining Changes in Trait Distribution

@Home Unit Lesson Index

This resource correlates lessons from the Standard Curriculum with @Home Unit Lessons.

It also lists the @Home Unit Student Sheets with information about where they came from (i.e. Student Investigation Notebook, copymaster, or new for the @Home Unit)

Pages 8-10



AmplifyScience
Natural Selection @Home Lesson Index

The Amplify Science@Home Units are versions of Amplify Science units adapted for use in a remote learning or hybrid learning situation. To help you plan instruction, below we have listed the @Home Lessons alongside the Amplify Science unit's Lesson(s) from which they come.

Index: @Home Unit Lessons and corresponding *Natural Selection* Lessons

@Home Lesson	Adapted from Amplify Science *Natural Selection*
@Home Lesson 1	Lesson 1.1
@Home Lesson 2	Lesson 1.4
@Home Lesson 3	Lesson 1.5
@Home Lesson 4	Lesson 1.6
@Home Lesson 5	Lesson 2.1
@Home Lesson 6	Lesson 2.2
@Home Lesson 7	Lesson 2.3
@Home Lesson 8	Lesson 2.4
@Home Lesson 9	Lesson 3.1
@Home Lesson 10	Lesson 3.2
@Home Lesson 11	Lesson 3.3
@Home Lesson 12	Lesson 4.1
@Home Lesson 13	Lesson 4.2 and 4.3
@Home Lesson 14	Lesson 4.4

Natural Selection @Home Lesson Index 1

modified versions of the unit's
necessary, new pages were also
Sheet and Packet page titles and

nding *Natural Selection*

			Possible Responses
	Partner A		N/A
4	Write and Share Routine: Partner B	Modified from Pg. 37	N/A
4	Explaining Changes in the Newt Population	Modified from Pg. 39	Lesson 1.4, Activity 2, Possible Responses
4	Chapter 1 Science Wall	New	Lesson 1.4, Activity 3, Possible Responses
5	Reproduction in the Sim	Modified from Pgs. 46-47	Lesson 1.4, Activity 3, Possible Responses
6	Observing Reproduction in the Sim	Modified from Pg. 54	Lesson 1.4, Activity 4, Possible Responses
			Lesson 1.5, Activity 2, Possible Responses
			Lesson 1.5, Activity 3, Possible Responses
			Lesson 1.5, Activity 3, Possible Responses
			Lesson 1.6, Activity 2, Possible Responses
			Lesson 1.6, Activity 2, Possible Responses
			Lesson 1.6, Activity 3, Possible Responses
			N/A
			Lesson 2.1, Activity 2, Possible Responses
			Lesson 2.2, Activity 2, Possible Responses

Natural Selection @Home Lesson Index 2

	2.3 Digital ces		N/A
			Lesson 2.4, Activity 2, Possible Responses
	ed from Pg. 70		N/A
	ed from Pgs. 72-73		Lesson 2.4, Activity 4, Possible Responses
			N/A
	3.1 Digital ces		N/A
	2		Lesson 3.2, Activity 2, Possible Responses
	3		Lesson 3.2, Activity 3, Possible Responses
	ed from Pgs. 5		Lesson 3.2, Activity 3, Possible Responses
	ed from Pg. 105		Lesson 3.2, Activity 3, Possible Responses
	ed from Pg. 111		Lesson 3.3, Activity 2, Possible Responses
	ed from Pg. 111		Lesson 3.3, Activity 2, Possible Responses
	4		Lesson 3.3, Activity 3, Possible Responses
	ed from Pg. 115		Lesson 3.3, Activity 3, Possible Responses
			N/A
	ed from Lesson 4.1 Resources		N/A
	4.1 Digital ces		N/A
	6		N/A
13	Argumentation Sentence Starters	8.5x11 Print Resources	N/A
13	Writing a Scientific Argument	8.5x11 Print Resources	Lesson 4.3, Activity 4, Possible Responses

Natural Selection @Home Lesson Index 3

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Adapted from: Amplify Science *Natural Selection* Lesson 1.2 and 1.3

Key activities

- **Introducing the Poisonous Newts:** Students are introduced to the unit problem and their role as student biologists.
- **Observe:** Students make observations of individuals in a population of butterflies in order to learn about traits in a population.
- **Do**: Students use the *Natural Selection* Sim, or watch a video of the Sim investigation, to learn how to make different traits in the populations of the Sim.

Ideas for synchronous or in-person instruction

Before meeting, have students watch the introductory video. While meeting, have students share their initial ideas about the video. Have students work in groups of three to four to observe the Butterfly Population Cards, then share as a class. Provide students with time to explore the Sim then ask students to complete the Sim activity for this Lesson. With the whole class, discuss what students learn from using the Sim, then show the Histogram video and discuss it as well.

Natural Selection

@Home Lesson 1

AmplifyScience

Today, we will begin a new unit called *Natural Selection*. In this unit we will learn about how populations of organisms change over time.

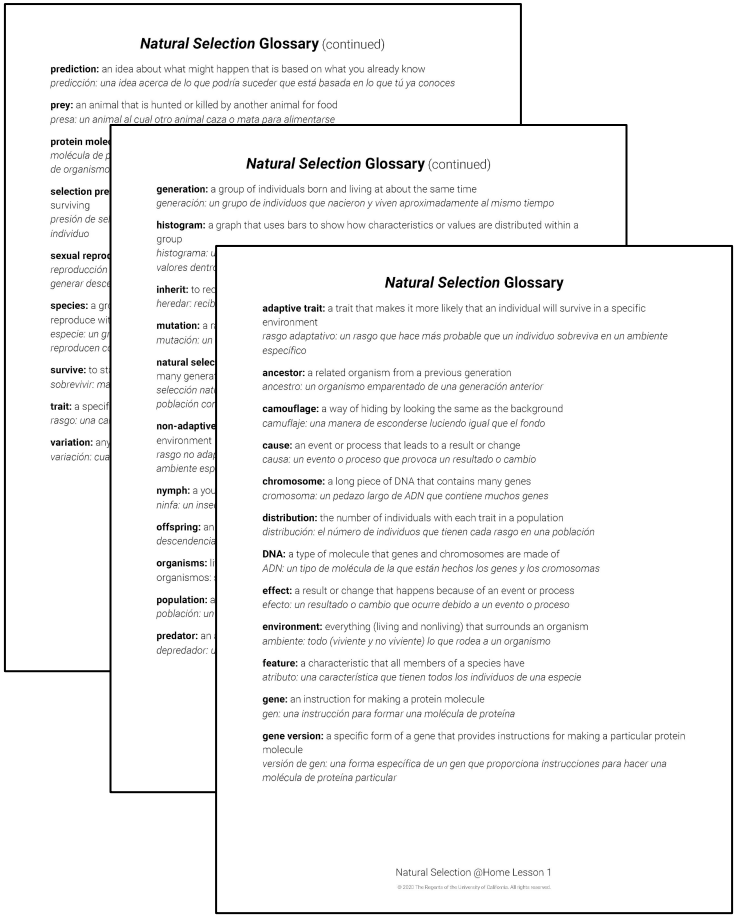
Look at the image of a population of dart frogs from a rain forest in Ecuador on the next slide. What do you notice about them?

The frogs on the previous slide represent a population.

population

a group of the same type of organism living in the same area

In this lesson and throughout the unit you will need to **access different pages** such as the Glossary on the next slide. Check with your teacher about how you will access materials and complete and submit work in this @Home Unit.



***Natural Selection* Glossary** (continued)

prediction: an idea about what might happen that is based on what you already know
predicción: una idea acerca de lo que podría suceder que está basada en lo que tú ya conoces

prey: an animal that is hunted or killed by another animal for food
presa: un animal al cual otro animal caza o mata para alimentarse

protein mole
molécula de p
de organismo

selection pre
surviving
presión de se
individuo

sexual reproc
reproducción
generar desc

species: a gr
reproduce wit
especie: un gr
reproducen c

survive: to st
sobrevivir: ma

trait: a specif
rasgo: una ca

variation: any
variación: cua

***Natural Selection* Glossary** (continued)

generation: a group of individuals born and living at about the same time
generación: un grupo de individuos que nacieron y viven aproximadamente al mismo tiempo

histogram: a graph that uses bars to show how characteristics or values are distributed within a group
histograma: u
valores dentro

inherit: to rec
heredar: recib

mutation: a r
mutación: un

natural selec
many genera
selección nat
población cor

non-adaptive
environment
rasgo no ada
ambiente esp

nymph: a you
ninfa: un inse

offspring: an
descendencia

organisms: li
organismos:

population: a
población: un

predator: an
depredador: u

***Natural Selection* Glossary**

adaptive trait: a trait that makes it more likely that an individual will survive in a specific environment
rasgo adaptativo: un rasgo que hace más probable que un individuo sobreviva en un ambiente específico

ancestor: a related organism from a previous generation
ancestro: un organismo emparentado de una generación anterior

camouflage: a way of hiding by looking the same as the background
camuflaje: una manera de esconderse luciendo igual que el fondo

cause: an event or process that leads to a result or change
causa: un evento o proceso que provoca un resultado o cambio

chromosome: a long piece of DNA that contains many genes
cromosoma: un pedazo largo de ADN que contiene muchos genes

distribution: the number of individuals with each trait in a population
distribución: el número de individuos que tienen cada rasgo en una población

DNA: a type of molecule that genes and chromosomes are made of
ADN: un tipo de molécula de la que están hechos los genes y los cromosomas

effect: a result or change that happens because of an event or process
efecto: un resultado o cambio que ocurre debido a un evento o proceso

environment: everything (living and nonliving) that surrounds an organism
ambiente: todo (viviente y no viviente) lo que rodea a un organismo

feature: a characteristic that all members of a species have
atributo: una característica que tienen todos los individuos de una especie

gene: an instruction for making a protein molecule
gen: una instrucción para formar una molécula de proteína

gene version: a specific form of a gene that provides instructions for making a particular protein molecule
versión de gen: una forma específica de un gen que proporciona instrucciones para hacer una molécula de proteína particular

Natural Selection @Home Lesson 1

Throughout the year, you can look up vocabulary words in the **Glossary** to help you understand what they mean. You can find this in your student pages or in the Amplify Library.

***Natural Selection* Glossary** pages or **Amplify Library**

The frogs in the image you just examined are 15 **individuals** from **one population of a species** of dart frogs. In this unit, we will focus on a different population that has some very interesting traits.

Let’s watch a video that will explain your role in this unit.

You will be helping to solve a mystery about a specific **population of rough-skinned newts.**

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

Using the print version? Watch the video here: **tinyurl.com/AMPNS-11**

As you heard in the video, some of these newts are poisonous enough to kill a human. But the population did not always have so many individuals who were extremely poisonous.

We'll investigate why the population **changed over time.** Read the message on the next slide to learn more.

To: Student Biologists
From: Dr. Alex Young, Head Biologist
Subject: Claims About the Rough-Skinned Newts

Hello, student biologists! I'd like to ask for your help in investigating the following claims. These claims were brought to us by park visitors.

Claim 1: Some people think that some newts became more poisonous because they wanted to—newts do seem like smart creatures!

Claim 2: Others suggest something in the environment caused the newts to become more poisonous.

Please let us know what you find out about these claims!

Below is the question that will guide our work across the entire unit:

Unit Question

Why do populations change over time?

We will investigate why populations like the rough-skinned newts in Oregon State Park change over time.

We will begin by trying to figure out the answer to this question:

Chapter 1 Question

What caused this newt population to become more poisonous?

What caused this newt population to become more poisonous?

Claim 1: Individual newts became more poisonous because they wanted to.

Claim 2: The newt population became more poisonous because of something in the environment.

Here are two claims that respond to the Chapter 1 Question.

What are your **initial ideas** about the claims?

What caused this newt population to become more poisonous?

Claim 1: Individual newts became more poisonous because they wanted to.

Claim 2: The newt population became more poisonous because of something in the environment.

We will continue to think about this question and these two claims throughout Chapter 1.

Adapted from: Amplify Science *Natural Selection* Lesson 1.2 and 1.3

Key activities

- **Introducing the Poisonous Newts:** Students are introduced to the unit problem and their role as student biologists.
- **Observe:** Students make observations of individuals in a population of butterflies in order to learn about traits in a population.
- **Do**: Students use the *Natural Selection* Sim, or watch a video of the Sim investigation, to learn how to make different traits in the populations of the Sim.

Ideas for synchronous or in-person instruction

Before meeting, have students watch the introductory video. While meeting, have students share their initial ideas about the video. Have students work in groups of three to four to observe the Butterfly Population Cards, then share as a class. Provide students with time to explore the Sim then ask students to complete the Sim activity for this Lesson. With the whole class, discuss what students learn from using the Sim, then show the Histogram video and discuss it as well.

Today we will investigate this question:

Investigation Question:
How can we describe a population?

The first step in understanding why this population of newts changed over time is to learn more about **what a population is and how it can be described**.

Once we know how to describe a population, we can recognize when a population has changed and describe that change.

When you were examining the individuals in this population you probably noticed **similarities and differences**. For example, they are **similar** because they all have four legs. However, the spots on their skin are very **different**.

Here is a population of dog face butterflies.

What was one thing that all of these butterflies have in common?

What is different about these butterflies?

All of the butterflies had one or more **colors** on their wings. Wing color is an example of a **feature**: a characteristic that all members of a species have, which varies between organisms.

The different **versions** of this feature (for example, yellow, orange, or black for wing color) are called **traits.**

This word can help us describe populations:

trait

a specific characteristic of an individual organism

Observing the animal populations has helped us investigate this question:

Investigation Question:
How can we describe a population?

For example, we might say that this population has **different traits** for wing color: some are yellow, some are yellow with black spots, etc.

Key activities

- **Introducing the Poisonous Newts:** Students are introduced to the unit problem and their role as student biologists.
- **Observe:** Students make observations of individuals in a population of butterflies in order to learn about traits in a population.
- **Do**: Students use the *Natural Selection* Sim, or watch a video of the Sim investigation, to learn how to make different traits in the populations of the Sim.

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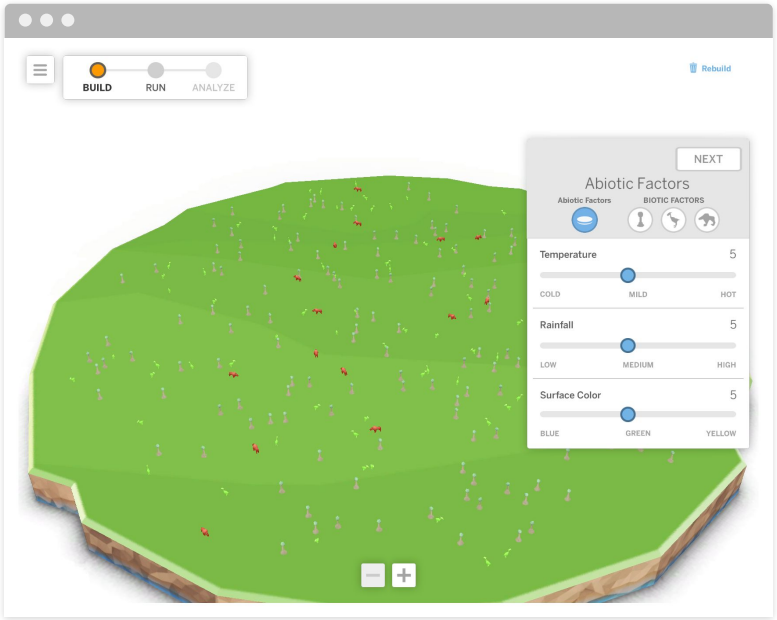
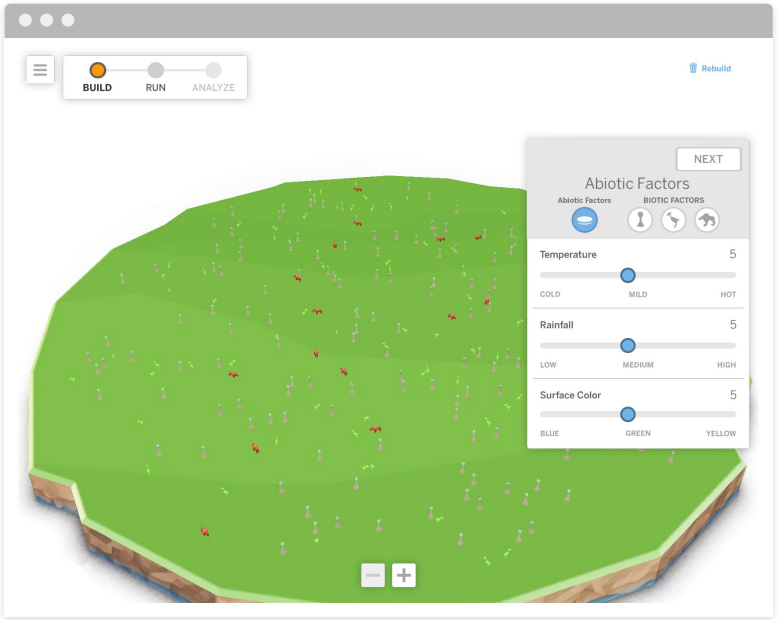
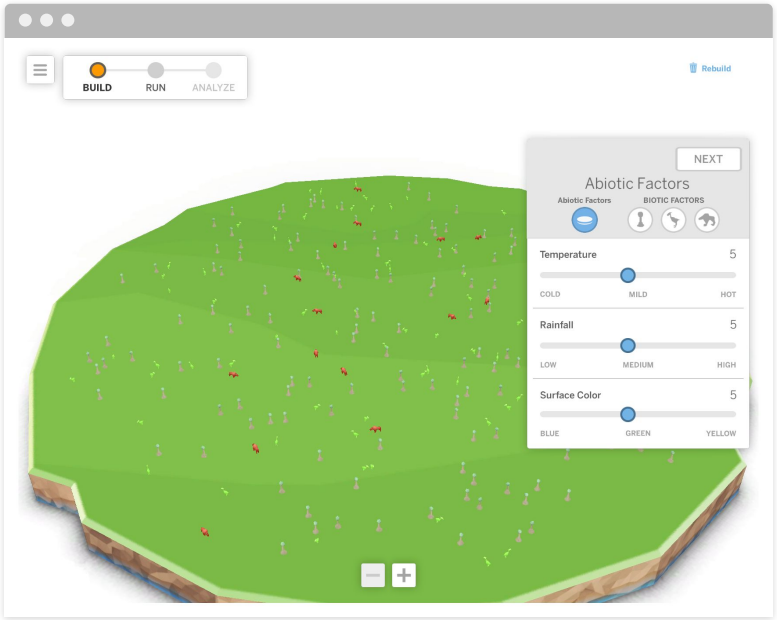


Throughout the unit, we will be using the ***Natural Selection*** **Simulation.**

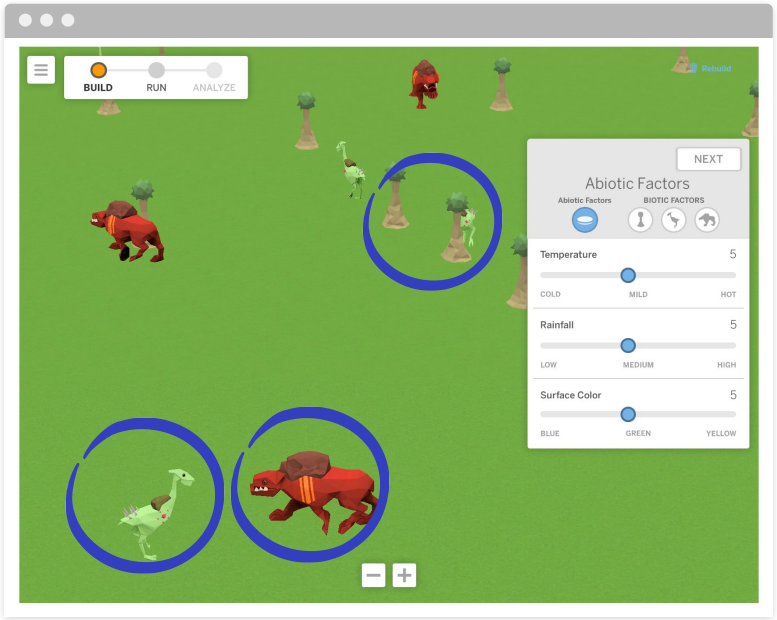
In this lesson you will use the Sim or watch a video of a Sim investigation. Check with your teacher about how you will access Sims and other digital tools in this @Home Unit.



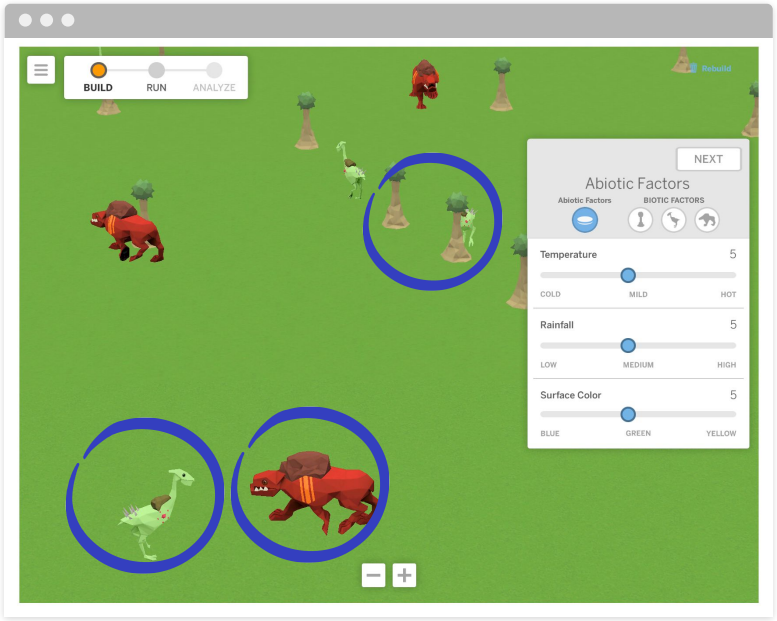
A simulation is a type of **scientific model.** Models can help us study things that happen very slowly.



Since a sim can show changes in a population **much more quickly** than they happen in nature, they are important tools for biologists who study populations of organisms.



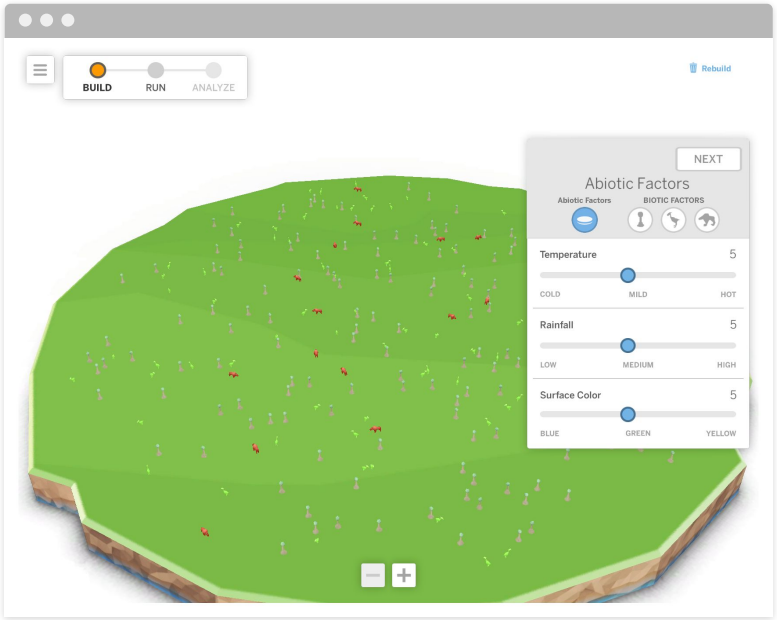
Today, we'll use the *Natural Selection* Sim to set up populations of organisms and observe their variation in traits. There are three types of organisms in the Sim: **thornpalms, ostrilopes,** and **carnithons.**



These organisms are not real, but you can learn about populations of real organisms from observing these organisms in the Sim.

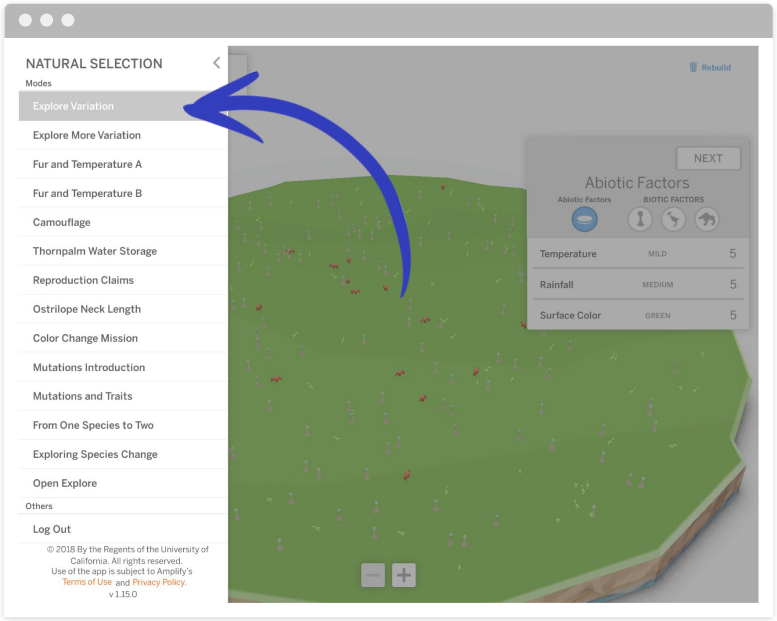
Watch the video on the next slide to learn more about the Sim.

Using the print version? Watch the video here: tinyurl.com/AMPNS-12



The goal of the first set of Sim missions is to set up and observe **different populations.**

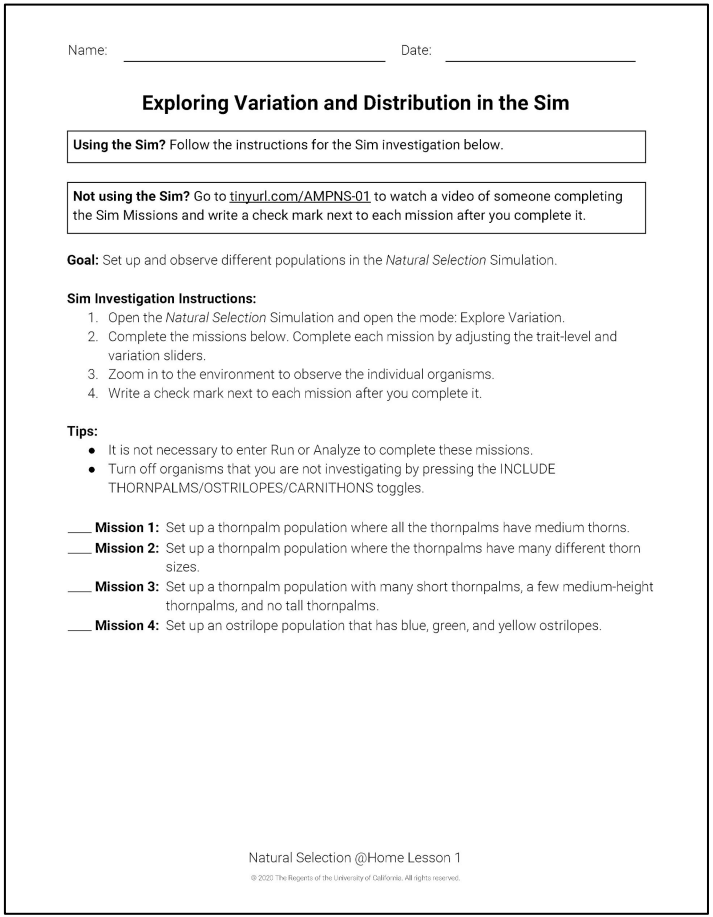
We can complete all the missions in **Build** without entering Run.



Each Sim activity has a mode with settings that make it easier to complete. In this activity, you'll focus on a few features of each Sim organism using **Explore Variation** mode.

We will be setting up different populations in the Sim and **changing the traits** of individuals in the populations.

This is possible in the Sim, but it is **not** how populations actually change in the real world. In the real world, traits such as color and fur level stay the same for the life of an individual.



Name: _____ Date: _____

Exploring Variation and Distribution in the Sim

Using the Sim? Follow the instructions for the Sim investigation below.

Not using the Sim? Go to tinyurl.com/AMPNS-01 to watch a video of someone completing the Sim Missions and write a check mark next to each mission after you complete it.

Goal: Set up and observe different populations in the *Natural Selection* Simulation.

Sim Investigation Instructions:

1. Open the *Natural Selection* Simulation and open the mode: Explore Variation.
2. Complete the missions below. Complete each mission by adjusting the trait-level and variation sliders.
3. Zoom in to the environment to observe the individual organisms.
4. Write a check mark next to each mission after you complete it.

Tips:

- It is not necessary to enter Run or Analyze to complete these missions.
- Turn off organisms that you are not investigating by pressing the INCLUDE THORNPALMS/OSTRILOPES/CARNITHONS toggles.

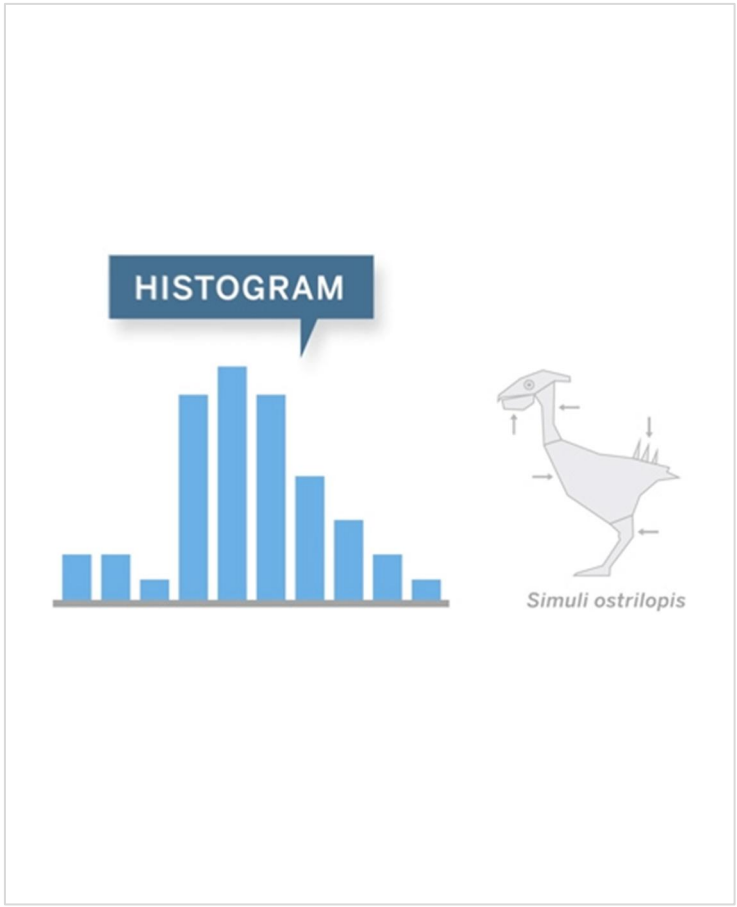
___ **Mission 1:** Set up a thornpalm population where all the thornpalms have medium thorns.
___ **Mission 2:** Set up a thornpalm population where the thornpalms have many different thorn sizes.
___ **Mission 3:** Set up a thornpalm population with many short thornpalms, a few medium-height thornpalms, and no tall thornpalms.
___ **Mission 4:** Set up an ostrilope population that has blue, green, and yellow ostrilopes.

Natural Selection @Home Lesson 1

Find the Exploring Variation and Distribution in the Sim page. Use the Sim or watch a video of this Sim investigation.

Complete the four Missions.

Exploring Variation and Distribution in the Sim page



You saw a graph called a histogram in the Sim, which is an important type of visual representation that we'll use throughout this unit.

Next, we'll watch a video explaining **histograms.**

Using the print version? Watch the video here: **tinyurl.com/AMPNS-13**

You have seen several examples of variation within populations.

variation

any difference in traits between individual organisms

As we think about how populations change over time we will need to think about different generations.

generation

a group of individuals born and living at about the same time

A histogram is a useful way to look at the distribution of traits in a population.

distribution

the number of individuals with each trait in a population

We learned that individuals in a population can have **different traits** for the **same feature**. When individuals have different traits, the population has **variation**. We can also talk about how many individuals in a generation have each trait. This is called the **distribution of traits in a population**. This information can be shown in a **histogram**.

The Sim creates a **histogram** in the Population menu as you set up each population.

This **key concept** summarizes what we have learned today.

1. A population can be described by the traits present and by the number of individuals who have each trait.

End of @Home Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Amplify.

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Adapted from: Amplify Science *Natural Selection* Lesson 1.2 and 1.3

Key activities

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- **Observe:** Students make observations of individuals in a population of butterflies in order to learn about traits in a population.
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Ideas for synchronous or in-person instruction

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Suggestions for Online Synchronous Time

Online synchronous time

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

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

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

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

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

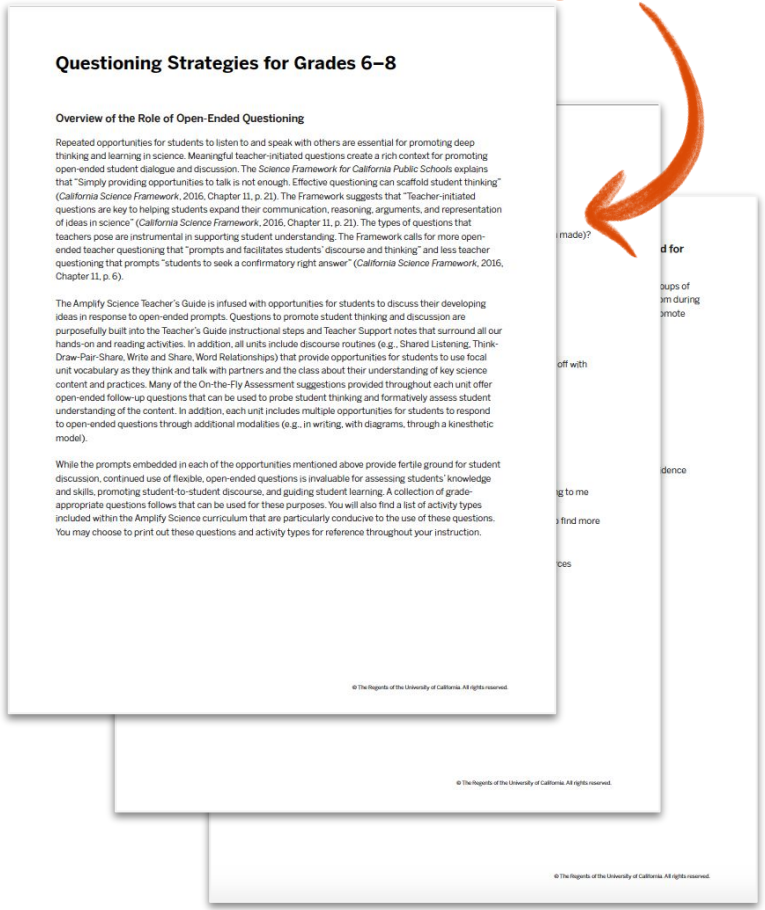
page 18

Questioning Strategies

Open-Ended Questions to Facilitate Student Thinking & Discourse

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

Pages 19-21



Questioning Strategies for Grades 6–8

Overview of the Role of Open-Ended Questioning

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

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

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

Reflection: Teaching @Home Lesson 1

How would you teach this lesson?

How might you include suggestions for online synchronous time and/or questioning strategies?

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

Day @Home Lesson 1

Minutes for science: 15 min

Instructional format:
- [x] Asynchronous
- [ ] Synchronous

Lesson or part of lesson:
Introducing the poisonous newts (slides 1-15)

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

Students will...	Teacher will...
View slides and the video that introduces students to the unit. Jot down initial ideas about their reactions to the video.	Assign slides 1-15 in Schoology and provide direction for students to jot down their ideas about the unit problem to share when the class meets together.

Minutes for science: _____

Instructional format:
- [ ] Asynchronous
- [x] Synchronous

Lesson or part of lesson:

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

Students will...	Teacher will...

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

Day@Home Lesson 1	
Minutes for science: 15 min. **Instructional format:** ☒ Asynchronous ☐ Synchronous	**Minutes for science:** 30 min **Instructional format:** ☐ Asynchronous ☒ Synchronous
Lesson or part of lesson: Introducing the poisonous newts (slides 1-15) **Mode of instruction:** ☒ Preview ☐ Review ☐ Teach full lesson live ☐ Teach using synchronous suggestions ☒ Students work independently using: ☐ Printed @Home Slides ☒ Digital @Home Slides ☐ @Home Videos	**Lesson or part of lesson:** Summarize the introduction to the unit, make observations of individuals in a population & engage with the simulation. **Mode of instruction:** ☐ Preview ☐ Review ☐ Teach full lesson live ☒ Teach using synchronous suggestions ☐ Students work independently using: ☐ Printed @Home Slides ☐ Digital @Home Slides ☐ @Home Videos
Students will... View slides and the video that introduces students to the unit. Jot down initial ideas about their reactions to the video.	**Teacher will...** Assign slides 1-15 in Schoology and provide direction for students to jot down their ideas about the unit problem to share when the class meets together.
Students will... Work in groups of three to four to observe the Butterfly Population Cards, then share as a class. They will complete the Sim activity for this Lesson. Finally, they will discuss what they learn from using the Sim, then view the Histogram video and discuss it as well.	**Teacher will...** Revisit the unit question on slide 12 and the claims on slide 14. Present slides 15-24 giving students an opportunity to observe the butterfly population cards.. Introduce the simulation via slides 25-43 & give students an opportunity to engage with SIM..

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

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

Asynchronous: students jot down their initial ideas

Synchronous: record observations while engaging with the simulation and as they explore butterfly populations

Some Types of Written Work in Amplify Science

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

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

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

Synchronous: Students will use the student sheets to record their observations while engaging with the simulation & submit through Schoology.

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

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

English-Chinese Glossary

adaptive trait: a trait that makes it more likely that an individual will survive in a specific environment
适应性性状: 使个体在特定环境中存活率更高的性状

ancestor: a related organism from a previous generation
祖先: 具有亲缘关系的上代生物体

camouflage: a way of hiding by looking the same as the background
伪装: 使自己与环境融为一体的隐藏方式

cause: an event or process that leads to a result or change
原因: 导致某种结果或变化的事件或过程

chromosome: a long piece of DNA that contains many genes
染色体: 含有许多基因的 DNA 长链

distribution: the number of individuals with each trait in a population
分布: 种群中具有每种性状的个体数量

DNA: a type of molecule that genes and chromosomes are made of
DNA: 构成基因和染色体的分子

effect: a result or change that happens because of an event or process
效应: 由于某个事件或过程而产生的结果或变化

environment: everything (living and nonliving) that surrounds an organism
环境: 生物体周围的所有（有生命和无生命的）事物

feature: a characteristic that all members of a species have
特征: 某个物种的所有成员都具备的特性

gene: an instruction for making a protein molecule
基因: 产生蛋白质分子的指令

gene version: a specific form of a gene that provides instructions for making a particular protein molecule
基因型: 提供指令以产生特定蛋白质的特殊的基因

s. What are students working in the lesson(s) provide feedback on?
lify Science to the right for guidance.

bove, do you want to add one? Make notes below.
t down their initial ideas

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ork p
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k.

t initial ideas on paper or digitally to synchronous lesson

ll use the student sheets to record ngaging with the simulation and

- I notice/observe . . .
- I think this is important because . . .
- I wonder . . .

Some Types of Written Work in Amplify Science

- Daily written reflections
- Homework tasks
- Investigation notebook pages
- Written explanations (typically at the end of Chapter)

for Sim uses, investigations, etc

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

Supports:

- Encourage students to engage in student-to-student discussion
- Provide students with the Multi-Language Glossary where appropriate, add images
- Leverage primary language for discussions
- Teacher modeling of the simulation (could also use the video)
- Strategic partnering

Extension: Have students create a visual representation of what they learned from the simulation/discussion.

Teacher Overview - Chapter 1

Overview of @Home Lessons 2-5

@Home Lesson 2: GROUP 1

- Students complete a Sim activity that provides evidence about why an ostrilope population changed over time. Students are introduced to the Modeling Tool and use it to make a prediction about a new ostrilope population. Students test their predictions about Population B in the Sim.

@Home Lesson 3: GROUP 2

- Students run tests in the Sim in order to gather evidence to support or refute the claim that yellow color is always an adaptive trait in a yellow environment. Students use the Modeling Tool to predict how high water storage in a thornpalm population can become more common over time.

@Home Lesson 4: GROUP 3

- Students are introduced to the Write and Share routine, which they use to demonstrate their understanding of why the distribution of traits in a population changes. Students review the @Home Science Wall, including the Chapter Questions, key concepts, and vocabulary. Students use what they have learned to support a claim in order to answer the Chapter 1 Question.

@Home Lesson 5: GROUP 4

- Students use the Sim to gather evidence about whether or not reproduction always results in offspring with adaptive traits. Students learn about where jellies get the glowing trait.

Breakout groups

pages 13-14

Discussion prompts

Planning:

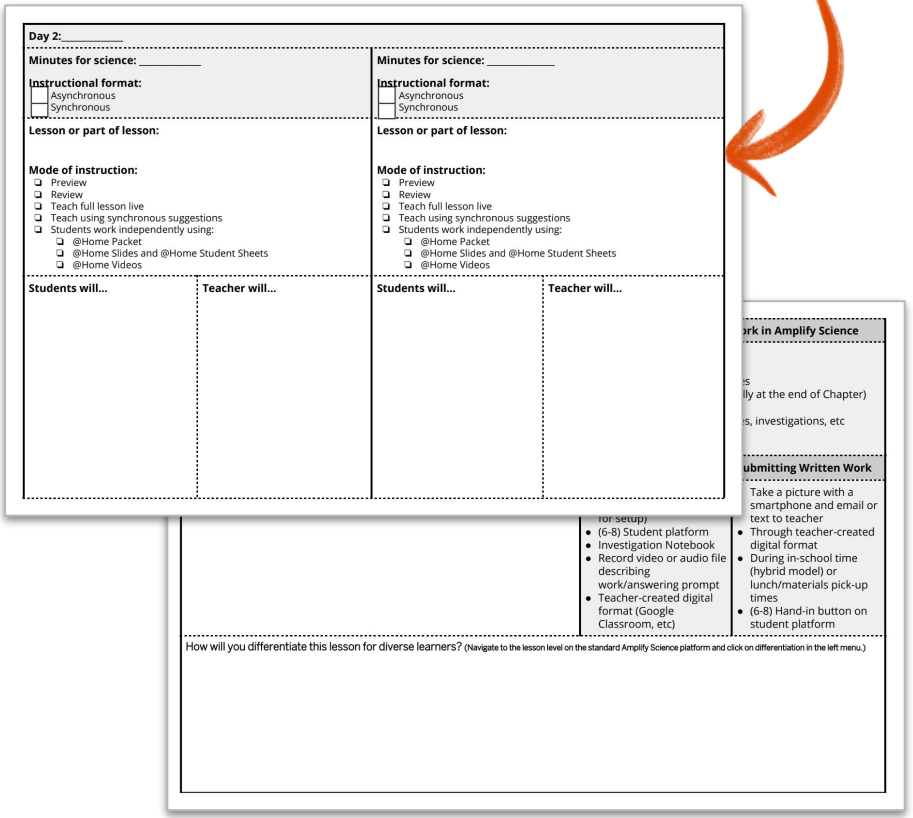
- Dig into the @Home Resources for your assigned lesson.

Student work:

- Discuss how you can collect evidence of student work

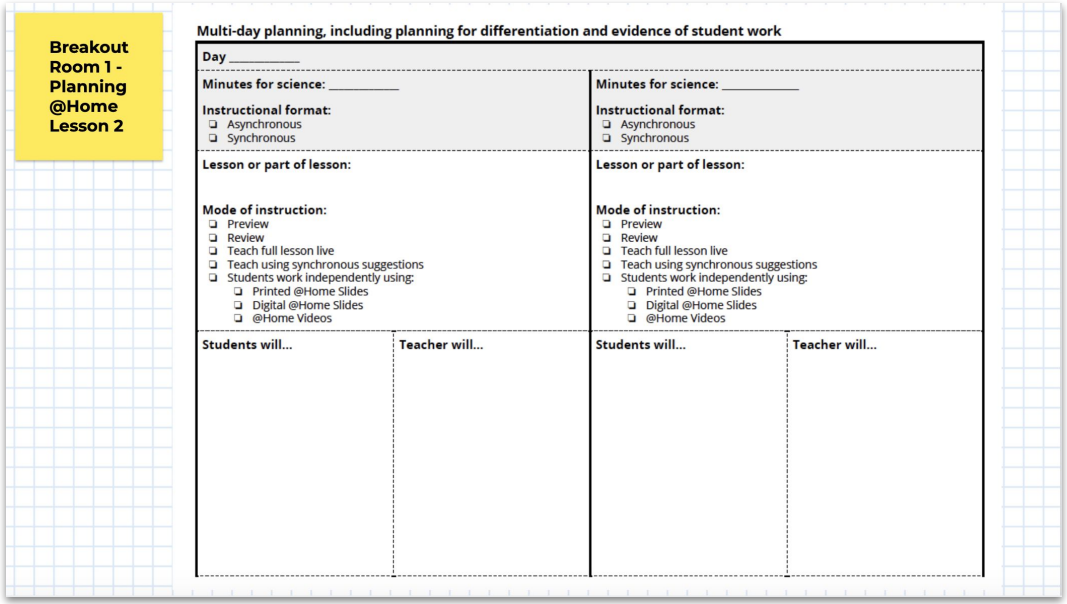
Differentiation:

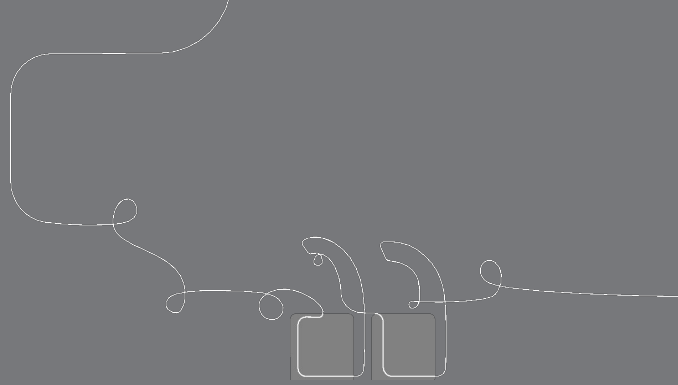
- Consider how you might differentiate your lesson



Planning Share Out

- What are your key takeaways from planning?
- Which lesson parts did you plan for synchronous vs. asynchronous time?





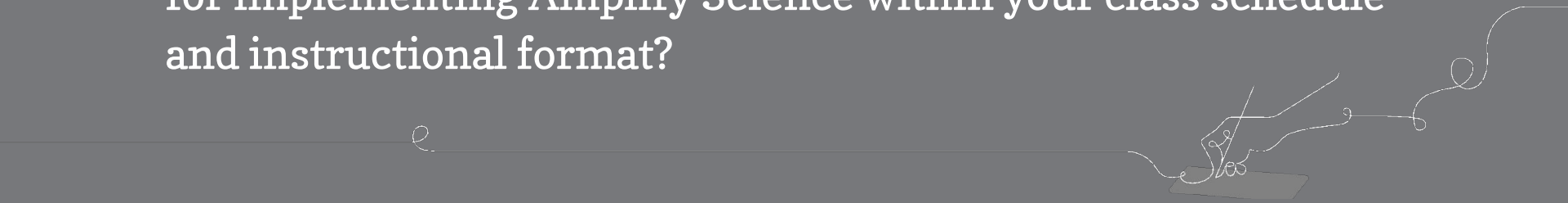
Questions?

Plan for the day

- Framing the day
  - Welcome
  - Instructional Materials
- Unit Internalization
- Planning to teach
  - Collecting evidence of student learning to meet diverse learner needs
- **Reflection and closing**

During this workshop did we meet our objectives?

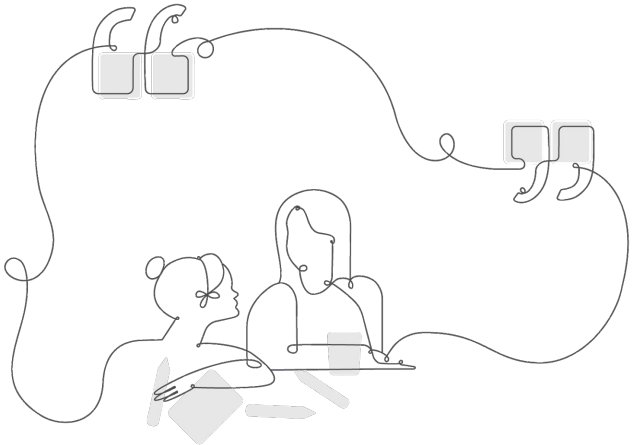
- Were you able to internalize your upcoming unit?
- Do you know how to plan for **collecting evidence of student learning** in order to make instructional decisions to **support diverse learner needs**?
- Do you have the resources you need to develop a multi-day plan for implementing Amplify Science within your class schedule and instructional format?



Upcoming LAUSD MS Office Hours

Bi-weekly from 3-4pm

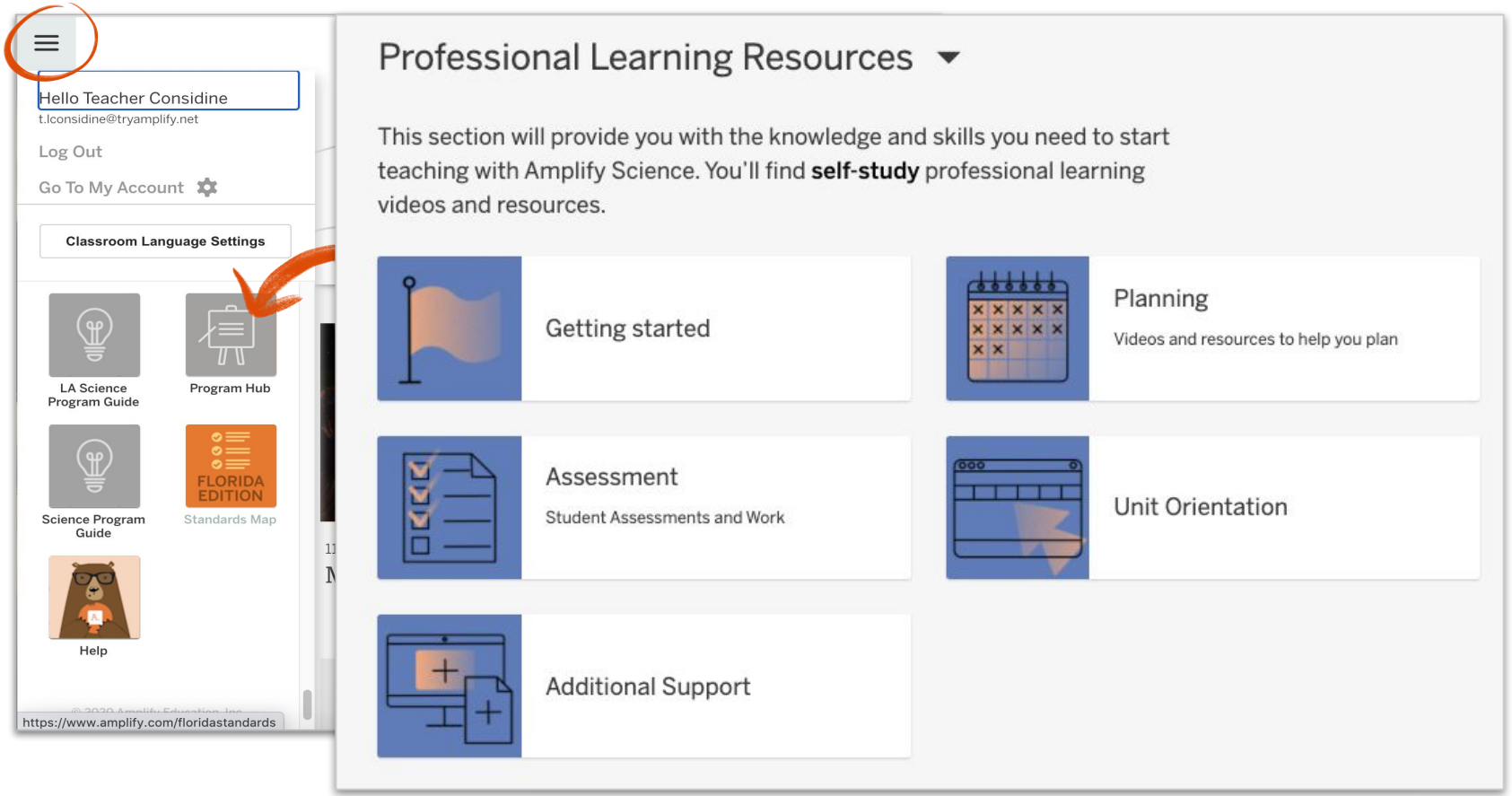
- Thursday, 3/11
- Thursday, 3/25
- Thursday, 4/8
- Thursday, 4/22
- Thursday, 5/13
- Thursday, 5/27



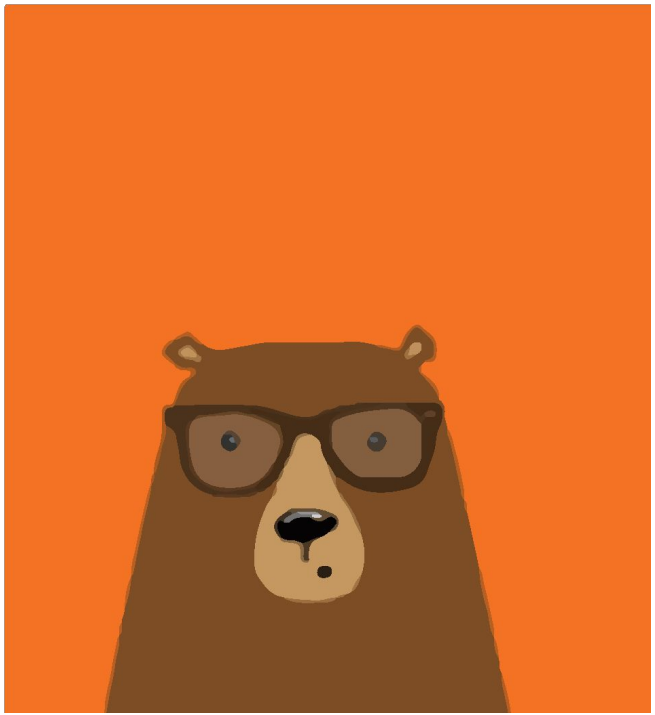
https://tinyurl.com/6-8OfficeHours

Additional Amplify resources

Program Hub: Professional Learning Resources



Additional Amplify resources

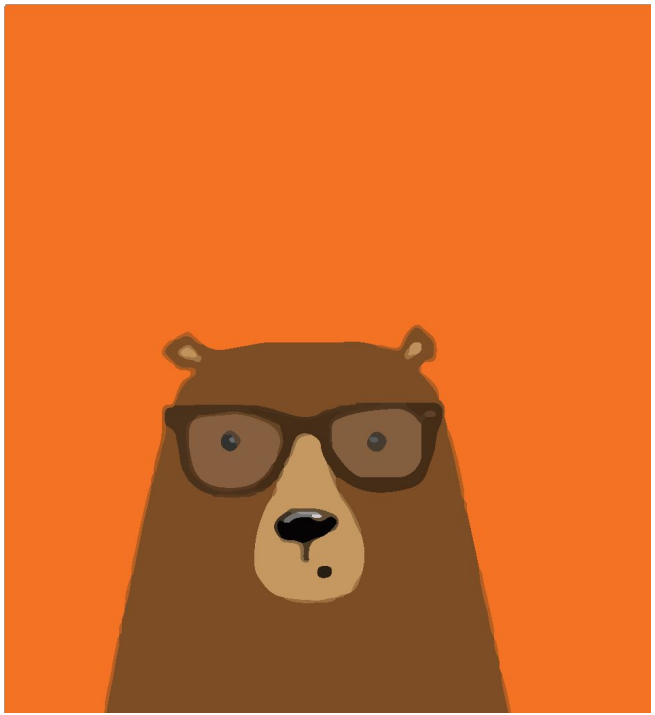


Caregivers site

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

amplify.com/amplify-science-family-resource-intro/

Additional Amplify resources



Program Guide

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

http://amplify.com/science/california/review

Amplify Help

Find lots of advice and answers from the Amplify team.

my.amplify.com/help

Additional Amplify Support

Customer Care

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

scihelp@amplify.com

800-823-1969

Amplify Chat

When contacting the customer care team:

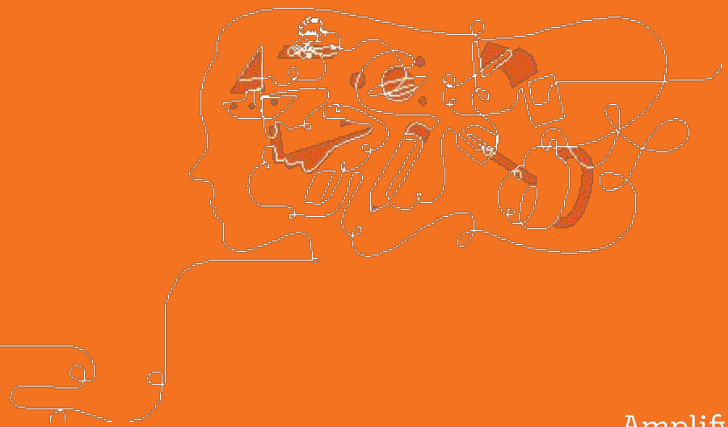
- Identify yourself as an Amplify Science user.
- Note the unit you are teaching.
- Note the type of device you are using (Chromebook, iPad, Windows, laptop).
- Note the web browser you are using (Chrome or Safari).
- Include a screenshot of the problem, if possible.
- Copy your district or site IT contact on emails.

Please provide us feedback!

URL: https://www.surveymonkey.com/r/AmplifyLAUSDMS

Presenter names (choose 1)**:**

Date: xx



Amplify.

Welcome to Amplify Science!

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

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

Click here for Remote Learning Resources for Amplify Science

Click here to go back to the LAUSD homepage.

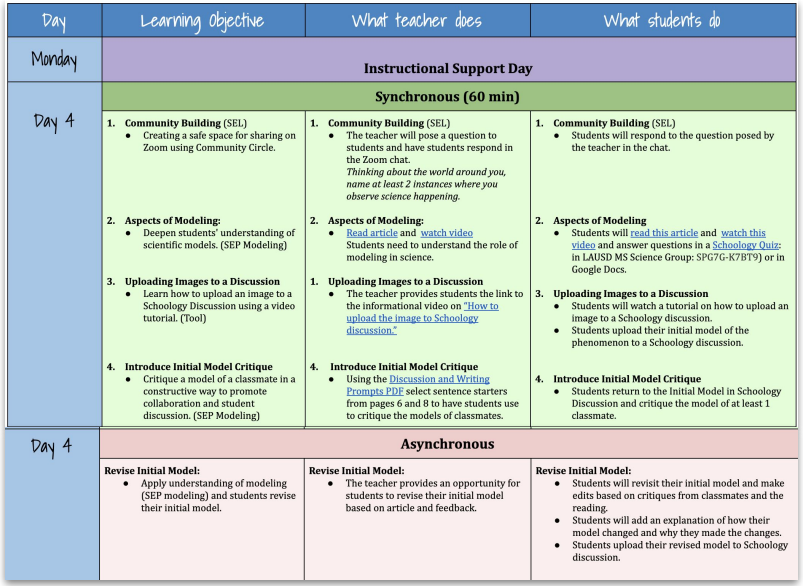
Click the button below to preview the digital Teacher's Guide, and check back for exciting updates to this site!

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

Smart Start Plans

Middle School Science Schoology Group

- Access code to join the Schoology Group: **SPG7G-K7BT9**
- Once in the group, you will find the Smart Start Plans under *resources*.



Day	Learning Objective	What teacher does	What students do
Monday	**Instructional Support Day**		
Day 4	**Synchronous (60 min)**		
	1. Community Building (SEL) • Creating a safe space for sharing on Zoom using Community Circle.	**1. Community Building** (SEL) • The teacher will pose a question to students and have students respond in the Zoom chat. *Thinking about the world around you, name at least 2 instances where you observe science happening.*	**1. Community Building** (SEL) • Students will respond to the question posed by the teacher in the chat.
	2. Aspects of Modeling: • Deepen students' understanding of scientific models. (SEP Modeling)	**2. Aspects of Modeling:** • Read article and watch video Students need to understand the role of modeling in science.	**2. Aspects of Modeling** • Students will read this article and watch this video and answer questions in a Schoology Quiz: in LAUSD MS Science Group: SPG7G-K7BT9) or in Google Docs.
	3. Uploading Images to a Discussion • Learn how to upload an image to a Schoology Discussion using a video tutorial. (Tool)	**1. Uploading Images to a Discussion** • The teacher provides students the link to the informational video on "How to upload the image to Schoology discussion."	**3. Uploading Images to a Discussion** • Students will watch a tutorial on how to upload an image to a Schoology discussion. • Students upload their initial model of the phenomenon to a Schoology discussion.
	4. Introduce Initial Model Critique • Critique a model of a classmate in a constructive way to promote collaboration and student discussion. (SEP Modeling)	**4. Introduce Initial Model Critique** • Using the Discussion and Writing Prompts PDF select sentence starters from pages 6 and 8 to have students use to critique the models of classmates.	**4. Introduce Initial Model Critique** • Students return to the Initial Model in Schoology Discussion and critique the model of at least 1 classmate.
Day 4	**Asynchronous**		
	Revise Initial Model: • Apply understanding of modeling (SEP modeling) and students revise their initial model.	**Revise Initial Model:** • The teacher provides an opportunity for students to revise their initial model based on article and feedback.	**Revise Initial Model:** • Students will revisit their initial model and make edits based on critiques from classmates and the reading. • Students will add an explanation of how their model changed and why they made the changes. • Students upload their revised model to Schoology discussion.

Creating Assignments in Schoology

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

LAUSD Shared Logins

AmplifyScience

Go to: my.amplify.com

A. Log In with Amplify

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

Elementary Student Apps Shared Logins

English
- Username: ampsci123
- Password: ampsci123

Spanish
- Username: ampsci123sp
- Password: ampsci123sp