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

Amplify Science

Unpacking Waves, Energy and Information for Hybrid Learning Unit 4, Grade 4

LAUSD

4/x/2021 Presented by Your Name In a new tab, please log in to your Amplify Science account through Schoology.

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Objectives

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

- Describe how students' conceptual understanding builds through the unit
- Explain how students figure out the phenomenon throughout the unit
- Make a plan for implementing Amplify Science within your class schedule and instructional format



Plan for the day

- Framing the day
 - Remote learning reflection
 - Revisiting the Amplify Approach

• Phenomenon at the unit level

- Navigation refresher (standard curriculum)
- Storyline and science concepts
- Unit internalization work time

• Planning to teach

- Navigation refresher (@Home resources)
- Lesson walkthrough
- Collaborative planning time
- Closing
 - Reflection & survey



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Opening reflection Jamboard

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



Key aspects of the Amplify Science instructional approach





Phenomenon-based instruction A shift in science instruction



Scientific phenomenon: An observable event in the natural world you can use science ideas to explain or predict



Multimodal learning

Gathering evidence over multiple lessons



Do, Talk, Read, Write, Visualize











Plan for the day

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 - Reflection & survey

Explaining the phenomenon: science concepts

Please respond in the chat

What **science concepts** do you think students need to understand in order to construct an explanation to explain how mother dolphins communicate with their calves?



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Next Generation Science Standards

Designed to help students build a cohesive understanding of science



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Disciplinary Core Ideas

Crosscutting Concepts

Unit Level

Practices

Using physical and computer models to observe and analyze patterns (patterns), students figure out how sound travels as a wave (energy and matter). They apply that knowledge to explain how dolphins in the fictional Blue Bay send and receive signals underwater when separated (energy and matter) and how humans encode, send, and receive patterns of information for efficient communication across distances (patterns; scale, proportion, and quantity).

Navigation Temperature Check

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

- 1 = Extremely Uncomfortable
- 2 = Uncomfortable
- 3 = Mild
- 4 = Comfortable
- 5 = Extremely Comfortable



Unit 22 Lessons Waves, Energy, and Information \sim Chapters Chapter 1: How does Chapter 2: How does Chapter 3: How does a mother dolphin sound energy travel a dolphin calf know communicate with which call is his through water from her calf across a... a mother dolphin t... mother's call? 6 Lessons 5 Lessons 7 Lessons Lesson 1.4: Lesson 1.5: Lesson 1.1: Lesson 1.2: Lesson 1.3: **Exploring Sound** Introducing Lessons Pre-Unit Assessment Exploring Waves Warning: Tsunami! Scientific Waves Explanation **Activities** -TEACHER-LED DISCUSSION TEACHER-LED DISCUSSION TEACHER-LED DISCUSSION WRITING Writing Initial Explanations Introducing the Scientific Thinking About Forms of **Dolphin Communication** Phenomenon Communication

Chapter 4: How can humans use patterns to communicate?

4 Lessons

Unit Guide Resources

Planning for the Unit	Printable Resources
Unit Overview	✓ Article Compilation
Unit Map	✓ ☑ Coherence Flowchart
Progress Build	Copymaster Compilation
Getting Ready to Teach	Flextension Compilation
Materials and Preparation	Investigation Notebook
Science Background	Guardians
Standards at a Glance	V Print Materials (8.5" x 11")
Teacher References	Print Materials (11" x 17")
Lesson Overview Compilation	✓ Offline Preparation
Standards and Goals	 Teaching without reliable classroom internet? Prepare unit and lesson
3-D Statements	materials for offline access.
Assessment System	✓ Offline Guide
Embedded Formative Assessments	×
Articles in This Unit	~
Apps in This Unit	~
Flextensions in This Unit	~

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, Scien Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts), Commo 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	tigation Notebook Digital version of the Investigation Notebook, for copying and projecting	
Multi-Language Glossary	age 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 provide in the kit	





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Unit Map

Planning for the Unit		Printable Resources
Unit Overview	~	Article Compilation
Unit Map		
Progress Build	~	
Getting Ready to Teach	~	Flextension Compilation
Materials and Preparation	~	Investigation Notebook
Science Background	~	NGSS Information for Parents and Guardians
Standards at a Glance	~	Print Materials (8.5" x 11")
Teacher References		Print Materials (11" x 17")
Lesson Overview Compilation	~	Offline Preparation
Standards and Goals	~	Teaching without reliable classroom internet? Prepare unit and lesson
3-D Statements	~	materials for offline access.
Assessment System	~	Offline Guide
Embedded Formative Assessments	~	
Articles in This Unit	~	
Apps in This Unit	~	
Flextensions in This Unit	~	

Waves, Energy, and Information

Planning for the Unit

Unit Map

Unit Map

How can a mother dolphin and her calf communicate underwater when they cannot see each other? How can humans use patterns to communicate?

Working in their role as marine scientists, students figure out how mother dolphins communicate with their calves. They write a series of scientific explanations with diagrams to demonstrate their growing understanding of how sound waves travel. Then they apply what they've learned about waves, energy, and patterns in communication to figure out how to create patterns that can communicate information over distances, transferring data from one place to another.

Chapter 1: How does a mother dolphin communicate with her calf across a distance?

Students figure out: Dolphins communicate through sound. When a mother dolphin makes a sound, that sound travels away from her in a pattern of motion called a wave. The sound energy moves through the water all the way to her calf even though the water itself only moves a little.

How they figure it out: Students use models to investigate waves, read about tsunamis, and explore different sounds with a digital simulation. They create sound diagrams and, using these diagrams as a resource, create a scientific explanation of the phenomenon.

Chapter 2: How does sound energy travel through water from a mother dolphin to her calf?

Students figure out: Sound energy travels by way of water particles. The water that the sound energy travels through is made of tiny particles that are too small to be seen individually but can move a little. When the mother dolphin makes a sound, the vibration from the sound hits the water particles near her and transfers energy, which makes those particles move. Those particles collide with particles next to them and transfer their energy, which makes the next particles move, and so on. This results in a wave—a pattern of motion that occurs when particles collide (compress) and then spread back apart. When the sound wave reaches the call, the call hears the sound.

How they figure it out: Students investigate how sound travels through different materials using hands-on activities, physical models, and digital models, as well as information they gather from books. They create models showing how energy travels through materials. Students revise their sound diagrams and write a revised scientific explanation.

Chapter 3: How does a dolphin calf know which call is his mother's call?

Students figure out: The sound waves that the mother dolphin makes have a certain amplitude and wavelength. When the amplitude of a sound is different, dolphins hear sound at a different volume. Sound with a larger amplitude is louder. This means that if the amplitude of the sound that the mother dolphin makes is large enough, the calf will be able to hear it. Dolphins make their own signature whistles. Each signature whistle has a certain pattern of wavelengths. When the wavelength of a sound is different, dolphins hear the sound at a different pitch. This means that dolphins hear certain patterns of pitches when they hear a signature whistle. The calf recognizes his mother's signature whistle and knows to respond. ne Unit ves, terns in dents

nation

Pages 2-3

Amplify

Use ideas from the Progress Build and Unit Map to make notes about the conceptual and explanatory builds in your unit. Science concepts Explanation of the phenomenon Students figure out... So they can explain... Chapter 1 Sound travels away from the source. In a pattern of motion called a wave. The sound energy moves through the water. Dolphins communicate through sound. Chapter 2 Chapter 2 Image: Chapter 2 Image: Chapter 2

Page 6

Applying conceptual understanding to explain the phenomenon

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Applying conceptual understanding to explain the phenomenon

Use ideas from the Progress Build and Unit Map to make notes about the conceptual and explanatory builds in your unit.

Page 6

	Science concepts	Explanation of the phenomenon
	Students figure out	So they can explain
Chapter 1	Sound travels away from the source. In a pattern of motion called a wave. The sound energy moves through the water.	Dolphins communicate through sound.
Chapter 2	The sound vibration hits the water particles and transfers energy which cause the particles to move. This movement of particles results in a sound wave.	The mother dolphin makes a sound that vibrates. That vibration makes a sound wave that reaches the calf and the calf hears the sound
100000000000000000000000000000000000000		

Chapter 2: How does sound energy travel through water from a mother dolphin to her calf?

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	movement of particles results in a sound wave.	movement of particles results in a sound wave.	
Chapter 3	The amptitude of a sound is the volume and the wavelength determines the sound's pitch.	Dolphins make their own signature whistles. Each whistle has a certain wavelength (pitch) and amplitude (volume). The calf recognizes his mother whistle	
Chapter 4			

Applying conceptual understanding to explain the phenomenon

Use ideas from the Progress Build and Unit Map to make notes about the conceptual and explanatory builds in your unit.

Page 6

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Chapter 4: How can humans use patterns to communicate?

Students figure out: There are multiple ways to transmit information across a distance, all of which involve using patterns as well as coding and decoding information.

	water.	
Chapter 2	The sound vibration hits the water particles and transfers energy which cause the particles to move. This movement of particles results in a sound wave.	The mother dolphin makes a sound that vibrates. That vibration makes a sound wave that reaches the calf and the calf hears the sound
Chapter 3	The amplitude of a sound is the volume and the wavelength determines the sound's pitch.	Dolphins make their own signature whistles. Each whistle has a certain wavelength (pitch) and amplitude (volume). The calf recognizes his mother's whistle
Chapter 4	Coding and decoding information as well as patterns are some of the multiple ways to transmit information across a distance.	Humans communicate using different patterns.

Progress Build

	Planning for the Unit		Printable Resources	
	Unit Overview	~	Article Compilation	
	Unit Map	~	Coherence Flowchart	
(Progress Build			
	Betting Ready to Teach	~		
	Materials and Preparation	~	Investigation Notebook	
	Science Background	~	NGSS Information for Parents and Guardians	
	Standards at a Glance	~	Print Materials (8.5" x 11")	
	Teacher References		Print Materials (11" x 17")	
	Lesson Overview Compilation	~	Offline Preparation	
	Standards and Goals	~	- Teaching without reliable classroom internet? Prepare unit and lesson	
-	3-D Statements	~	materials for offline access.	
	Assessment System	~	Offline Guide	
	Embedded Formative Assessments	~		
	Articles in This Unit	~		
	Apps in This Unit	~		
	Flextensions in This Unit	~		

Waves, Energy, and Information Planning for the Unit

Progress Build

Progress Build

A Progress Build describes the way in which students' explanations of the central phenomenon is expected to develop and deepen over the course of a unit. It is an important tool in understanding the design of the unit and in supporting students' learning. A Progress Build organizes the sequence of instruction, defines the focus of the assessments, and grounds inferences about students' understanding of the content, specifically at each of the Critical Juncture Assessments found throughout the unit. Critical Junctures signify points in the unit at which it is especially important that all students understand the content before continuing. This document serves as an overview of the Waves, Energy, and Information: Investigating How Dolphins Communicate Progress Build. Since each level of the Progress Build is an increasingly complex yet integrated explanation, we represent the bow by including the new ideas for each level ho bit.

In the Waves, Energy, and Information unit, students learn to construct scientific explanations of the central phenomenon: how a mother dolphin communicates with her calf when they are separated.

Prior knowledge and experience (preconceptions) Students are likely to have encountered the idea that sound happens when a source vibrates. They will also likely know that there are many different sounds, and that a sound can be heard at a point away from where it originated. While these ideas are not necessary for students to participate fully in the unit, having exposure to them will prepare students well for what they will be learning.

Progress Build Level 1: A wave is a pattern of motion.

A wave is a pattern of motion. The wave's energy travels away from the source. When a wave travels through something (e.g., water or air), the thing it travels through can move up and down or back and forth. Sound energy travels as a wave from source to listener. The thing the sound energy travels through moves only a little. When the sound wave gets to a listener, the listener thears the sound.

Progress Build Level 2: Sound energy travels through a material as a series of particle collisions.

A wave is a pattern of motion. The wave's energy travels away from the source. When a wave travels through something (e.g. water or al), the thing it travels through can move up and down or back and forth. Sound energy travels as a wave from source to listener. In a sound wave, the particles of the material the energy travels through more only a little. Sound energy travels through different kinds of materials. Materials are made of particles that are too small to see and are somewhat free to move. When a sound source vibrates, It coildies with the nearest particles of the material, transfers its energy, and causes the particles to move. Those particles coilide with the particles not the material, transfers its energy, and causes the particles to move. This results in the sound wave- the pattern of motion when particles coilide and spread apart—that travels through the material. When the coilisions reach the listener. the listener hears the sound.

Progress Build Level 3: Sound waves can differ in amplitude and wavelength.

A wave is a pattern of motion. The wave's energy travels away from the source. When a wave travels through something (e.g., water or air), the thing it travels through can move up and down or back and forth. Sound energy travels are a wave from source to listener. In a sound wave, the particles of the materials the energy travels through move only a little. Sound energy travels through different kinds of materials. Materials are made of particles that are too small to see and are somewhat free to move. When a sound source voltrates, it collides with the nearest particles of the material, transfers its energy, and causes the particles to move. Those particles collide with the particles next to them, transfer their energy, and cause the next particles to move. This results in the sound wave—the patter of motion when particles

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Page 4-5

And Information anning for the Unit

er, the listener hears the eaks of the wave. ner hears sounds with wes have different



Progress Build

Level 3: Sound waves can differ in amplitude and wavelength.

Level 2: Sound energy travels through a material as a series of particle collisions.

Level 1: A wave is a pattern of motion.



Additional science concept resources for teachers

Science Background: Adult-level summary of unit science concepts

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

Planning for the Unit	Printable Resources
Unit Overview	✓ ☐ Article Compilation
Unit Map	✓ Coherence Flowchart
Progress Build	Copymaster Compilation
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Assessment System	✓ Offline Guide
Embedded Formative Assessments	v
Articles in This Unit	×
Apps in This Unit	~
Flextensions in This Unit	~

Key Takeaway

Conceptual build and explanatory build

Throughout the unit, students' conceptual understanding grows deeper, allowing their explanations of the phenomenon to become more complete and complex.



Reflection Jamboard

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











Plan for the day

- Framing the day
 - Remote learning reflection
 - Revisiting the Amplify Approach

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Accessing the Program Hub



Amplify Science@Home resources reference

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

Instructional materials:

Click Remote and hybrid learning resources, then select your grade level from the dropdown menu. Select your unit.

@Home Unit resources:

These will appear when you select your unit.

Teacher Overview General information for teaching with @Home Units, planning information, chapter and lesson outlines Lesson Index Lists the original Amplify Science lessons associated with each @Home lesson, and the Investigation Notebook pages, copymasters, and print materials associated with the @Home Unit Student Sheets Family Overview Information to send home to families to help them support students with remote learning Student lesson Printable or digital lessons condensed to be about 30 minutes long. You can materials for access compilations of all student materials for your unit, or select from individual lessons. @Home Units @Home Video resources: After selecting your grade level and unit, select the @Home Videos tab below your unit title. @Home Video links Links to video lessons that include all activities from the original units. Lesson playlists are on YouTube, and they autoplay in a playlist form. Additional remote and hybrid instructional materials: These can be accessed from the tabs below your unit title. Hands-on Videos of every unit's hands-on activities (note, these videos also appear in the investigations student lesson materials). support Read-aloud videos Link to a YouTube playlist of read-aloud videos of all books in your unit. Orientation and Tutorials: Click Remote and hybrid learning resources, then select your grade from the dropdown menu. Click Orientation and Tutorials. You'll not only find videos to help you use the resources, but also videos you can share with students and caregivers.

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Program Hub work time ^{5 minutes}

Navigate to the Program Hub. Open:

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

If you have extra time, explore the other tabs.





Lesson Walkthrough



@Home Lesson 1

Adapted from: Amplify Science Waves, Energy, and Information Lesson 1.1

Key activities

- Introducing Blue Bay National Park: Students are introduced to the unit context and to their role as marine scientists investigating dolphin communication for Blue Bay National Park.
- **Observe:** Students listen to recordings of dolphin calls and record their observations.
- Write: Students write responses to explain the characteristics of a sound by analyzing a diagram of the sound wave.

Waves, Energy, and Information @Home Lesson 1

AmplifyScience



We are starting a new unit on **communication**.

We will study animals in a national park and work to explain how they **communicate**, or share information, underwater.



This picture shows a dolphin.

What do you know about **dolphins**?


This is Blue Bay, a place where many **bottlenose dolphins** live.

A **bay** is a section of a lake or the ocean that is formed by the shape of the shoreline.

The bay is part of a national park called Blue Bay National Park, shown in this map:





This is a **bottlenose dolphin** family.

These dolphins are very social and like to be around other dolphins. They usually stay close to their family members. The park has a **superintendent** who keeps track of the dolphins. She has observed the dolphins swimming in groups, and she often sees mother dolphins with their **calves**.

She has noticed that the dolphins seem to be able to **communicate** using body language to signal when food or danger is nearby.



Sometimes the **mother dolphins** leave their **calves** to search for food.

Even when they are too far apart to see each other, somehow they still find each other again.

The park superintendent thinks that the dolphins are somehow sending each other signals through the water that don't require them to see each other, but she doesn't understand how it could be possible for them to send a signal **underwater** that travels so far.



The superintendent is not sure how signals could travel so far underwater.

How could the dolphins be **sending signals** that travel underwater?

The park superintendent needs our help to study **dolphin communication**. We will be **marine scientists** whose job is to investigate more about dolphin communication.

Let's read a **message** from the park superintendent.



To: Marine Scientists From: Maya Martinez, Park Superintendent Subject: Dolphins in Blue Bay National Park



Thank you for helping us find out how the mother dolphins in Blue Bay National Park are communicating with their calves. Please investigate how signals could travel underwater and write to me once you have an explanation.

In this chapter, we will work to figure out:

Chapter 1 Question

How does a mother dolphin communicate with her calf across a distance?

We will be investigating how dolphins communicate.



to share information

	Glossary (continued)
pattern: something patrón: algo que ob	we observe to be similar over and over again oservarnos que sea similar una y otra vez
source: the plac fuente: el lugar	Glossary
transfer: to mov transferir: move	amplitude: how big or loud a wave is amplitud: cuán grande o fuerte es una onda
vibrate: to mov vibrar: mover h	collision: two or more things bumping into each other colisión: dos o más cosas que se golpean entre sí
visualize: to ma different source visualizar: hace	communicate: to share information comunicar: compartir información
diferentes fuent wave: a pattern	energy: the ability to make things move or change energía: la capacidad de hacer que las cosas se muevan o cambien
onda: un patrór	explanation: a description of how something works or why something happens
forma de onda:	explicación: una descripción de cómo algo funciona o por qué algo pasa investigate: to try to learn more about something
wavelength: the longitud de onc el siguiente	investigar: intentar aprender más acerca de algo
5	material: the start that makes up everything material: lo que constituye todo
	model: something scientists make to answer questions about the real world modelo: algo que los científicos crean para responder preguntas sobre el mundo real
	particle: a tiny piece of material that is too small to see partícula: un pedacito de material que es demasiado pequeño para ver
	Waves, Energy, and Information @Home Lesson 1

You have a **Glossary** you can use if you need to find definitions for science words we are using.

@Home Lesson 1

Adapted from: Amplify Science Waves, Energy, and Information Lesson 1.1

Key activities

- Introducing Blue Bay National Park: Students are introduced to the unit context and to their role as marine scientists investigating dolphin communication for Blue Bay National Park.
- **Observe:** Students listen to recordings of dolphin calls and record their observations.
- Write: Students write responses to explain the characteristics of a sound by analyzing a diagram of the sound wave.

We think the dolphins may be communicating using **sound**.

One way marine scientists study dolphin communication is by listening to and recording sounds dolphins make in the wild. We will **listen to some recordings** of dolphin sounds to find out more.

Note: All recordings and videos in this @Home Unit can be listened to or viewed on a smartphone or any other connected device.

Name: Date: Ideas About Dolphin Communication 1. What do you notice about the dolphin calls? 2. Record your observations. Waves, Energy, and Information @Home Lesson 1 @ 2020 The Repents of the University of California. All rights reserved

Find the Ideas About Dolphin Communication page.

As you listen to the dolphin calls, you will **record your observations** on this page.





Play each of the three sounds.

Record your observations as you listen to each dolphin call.

Using the print version? Listen to the sounds here: <u>tinyurl.com/AMPWEI-001</u>, <u>tinyurl.com/AMPWEI-002</u>, <u>tinyurl.com/AMPWEI-003</u>



In this unit, we're going to investigate **how sound can travel** between a mother dolphin and her calf underwater.



to try to learn more about something

@Home Lesson 1

Adapted from: Amplify Science Waves, Energy, and Information Lesson 1.1

Key activities

- Introducing Blue Bay National Park: Students are introduced to the unit context and to their role as marine scientists investigating dolphin communication for Blue Bay National Park.
- **Observe:** Students listen to recordings of dolphin calls and record their observations.
- Write: Students write responses to explain the characteristics of a sound by analyzing a diagram of the sound wave.

Mar	Name:		Date:
con	Pre-	Unit Writing: Explainin (cor	Ig Patterns in Communication
	Lab	Name:	Date:
_	cxp	Pre-Unit Writing:	: Explaining Patterns in Communication
		Maria was working on ho playing music on his con something about the mu surprised by the change	ornework quietly in her living room. Her brother v mputer on the other side of the room. Suddenly usic changed and surprised Maria. Maria was so in the music that she jumped!
vlak		The sound from the com	nputer looked like this:
_	Why deta 	How did the sound get fr how the sound energy tra	Mais before More Marked

Find the Pre-Unit Writing: Explaining Patterns in Communication pages.

You will use these pages to **write your first ideas** about sound.

Vlar	Name:		Date:
com	Pre-	Unit Writing: Explain	ing Patterns in Communication continued)
	Lab	Name:	Date:
_	0.15	Pre-Unit Writin	g: Explaining Patterns in Communication
		Maria was working on playing music on his co something about the m surprised by the chang	homework quietly in her living room. Her brother w omputer on the other side of the room. Suddenly nusic changed and surprised Maria. Maria was so je in the music that she jumped!
vlak		The sound from the co	mputer looked like this:
	Why deta 	How did the sound get how the sound energy	Muschefres Marrie Muschefres Marrie From the computer to Marria? Include details about traveled through the air.

There are **three pages** for writing, with one page for each question.

You can use the **diagram** of the sound on the first page to explain your thinking.

play	Name: _		Date:		
surp	Pre-	Unit Writing: Expla	ining Patterns in (continued)	n Communication	
The	Lab expl	Name:		Date:	
	0.10	Pre-Unit Wri	ting: Explaining (contin	Patterns in Commur	lication
		Maria's brother use computers help hur	d a computer (a digi mans send informat	tal device) to play his mu ion across distances?	sic. How do
Hov how					
	Why deta				
_		Make a drawing if it	helps you explain y	our thinking. Label your d	irawing.
-/					
_\	_				

On the last page, there is a box for you to make a **drawing** if it helps you explain your thinking.

Mar	Name: _		Date:
con	Pre	-Unit Writing: Expla	ning Patterns in Communication (continued)
	Lab exp	Name:	Date:
_		Pre-Unit Writ	ng: Explaining Patterns in Communication
		Maria was working o playing music on his something about the surprised by the cha	n homework quietly in her living room. Her brother w computer on the other side of the room. Suddenly music changed and surprised Maria. Maria was so nge in the music that she jumped!
Mak		The sound from the	computer looked like this:
	Why deta	How did the sound of how the sound energy	et from the computer to Maria? Include details about y traveled through the air.



Write to **explain** what you think happened.

Use the **diagram** to help you explain.

End of @Home Lesson





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Key activities

- Introducing Blue Bay National Park: Students are introduced to the unit context and to their role as marine scientists investigating dolphin communication for Blue Bay National Park.
- **Observe:** Students listen to recordings of dolphin calls and record their observations.
- Write: Students write responses to explain the characteristics of a sound by analyzing a diagram of the sound wave.

Ideas for synchronous or in-person instruction

While meeting, introduce students to the unit context and to their role as marine scientists investigating dolphin communication for Blue Bay National Park. Then, play the recordings of dolphin calls and invite students to share their observations.

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.

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Questioning Strategies

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

Questioning Strategies for Grades 2-5 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 belong 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, 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

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 gradeappropriate 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.

Overview of the Role of Open-Ended Questioning

Chapter 11, p. 6).

model).

pecially Suited for

pairs or small groups of ugh the classroom during ge and skills, promote

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

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Hands-on Suggestions

irade: 4	4 Unit: Waves Energy and Information Hands-		Unit: Waves Energy and Information Hands-On Investigation Video Playlist						
Lesson	Activity	@Home Lesson	Activity Description	Suggested Modality	Reasoning	Teacher/Student Provided Materials	Consumable Materials	Non-Consumable Materials	LAUSD Replacement Material
1.2	3		Students make waves using a rope and a spring toy. They make and record observations about these models to better understand how waves travel.	watch video	Students will need a partner to make waves with the rope. This could be assigned as a hands-on activity if students are able to enlist the help of someone at home. If not, students can observe the video demonstration.			2.5 meter rope, spring toy (slinkey) per student	
2.4	3	7	In pairs, students use coins to explore what happens when objects collide.	hands-on	This activity involves simple coins that could be found at home.	1 nickel, 3 pennies per student			
3.2	2	10	Students make and play straw reeds of different lengths in order to observe another property of sound: pitch.	hands-on	This activity would be simple for a student to do on their own. There are even directions with pictures under Digital Resources at the lesson level.	1 pair of scissors per student	1 plastic straw per student	1 plastic straw per student	1 plastic straw for each student



Reflection Jamboard

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



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

Minutes for science: <u>15 min</u>	L	Minutes for science:	
Asynchronous Synchronous		Instructional format: Asynchronous Synchronous	
Lesson or part of lesson: Introduce, student role (mar (slides 1-13) Mode of instruction: Preview Review Teach full lesson live Teach using synchronous sug Students work independently Printed @Home Slides Digital @Home Slides @Home Videos	ne biologists)n and unit context gestions using:	Lesson or part of lesson: Mode of instruction: Preview Review Teach full lesson live Teach using synchronous sugg Students work independently of Printed @Home Slides Digital @Home Slides @Home Videos	estions using:
Students will View slides and learn about the Blue Bay National Park and studying dolphin communication. Jot down initial ideas about dolphin communication.	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	Teacher will

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V

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

Minutes for science: 15 min	Day@Home Lesson 1				P-0-
Instructional format: Asynchronous Synchronous Synchronous Synchronous Synchronous Synchronous Synchronous Lesson or part of lesson: Synchronous Instructional format: Synchronous Synchronous Synchronous Lesson or part of lesson: Synchronous Instruction: Priview Review Preview Teach full lesson live Preview Preview Preview Privied eHome Sildes Digital @Home Sildes Bitled eHome Sildes Digital @Home Sildes Bitled eHome Sildes Digital @Home Sildes Bitled eHome Sildes @Home Videos Students will Assign sildes 1–15 in Schoology and provide direction for students Students will Vew Sildes and learn about the Blue Bay National Park and studying dolphin communication. Jot down initial Ideas about dolphin Students will Students will Orde as matine biologists. Teacher will Students of down their iogether. Students on the sase ormmunication and their role as about Dolphin Communication Page. Introduce the different dolphin sounds and direct students or other tideas on the sheet that is assigned in schoology.	Minutes for science: <u>15 Min.</u>	_	Minutes for science: <u>30 min</u>	_	
Lesson or part of lesson: Infroduce, student role (marine biologists)n and unit context (sildes 1-13) Mode of instruction: Preview Review Teach full lesson live Teach full lesson live Students will Throduce the unit question Present sildes 14-20 Introduce the different dolphin sounds and direct students to jot down their lesson D live dolphin communication Jot down initial Ideas about dolphin communication Jot down initial Ideas about dolphin communication page. Teach full lesson live the students complete as after hours work	Asynchronous Synchronous		Instructional format: Asynchronous Synchronous		
Students willTeacher willStudents willTeacher willView slides and learn about the Blue Bay National Park and studying dolphin communication. Jot down initial ideas about dolphin communication.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 Discuss their initial ideas about dolphin communication municationTeacher will Introduce the unit question Present slides 14-20 Introduce the different dolphin sounds and direct students jot down ideas on "ideas about Dolphin Communication" page.Teacher will Introduce the unit question Present slides 14-20 Introduce the different dolphin sounds and direct students to jot their ideas on the sheet that is assigned in schoology. (Student sheets @Home lesson D Introduce pre writing assessment and have students complete as after hours work.	Lesson or part of lesson: Introduce, student role (marine (slides 1-13) Mode of instruction: X Preview Review Teach full lesson live Teach using synchronous sugge Students work independently u Printed @Home Slides Digital @Home Slides @Home Videos	e biologists)n and unit context estions sing:	Lesson or part of lesson: Summarize the introduction to the unit. Introduce the chapter question and vocabulary and glossary resource. Have students listen to dolphin sounds (Slides 14-26) 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		K
	Students will View slides and learn about the Blue Bay National Park and studying dolphin communication. Jot down initial ideas about dolphin communication.	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 Discuss their initial ideas about dolphin communication and their role as marine biologists. Students jot down ideas on "Ideas about Dolphin Communication" page.	Teacher will Introduce the unit question Present slides 14-20 Introduce the different dolphin sounds and direct students to jot their ideas on the sheet that is assigned in schoology. (student sheets @Home lesson 1) Introduce pre writing assessment and have students complete as after hours work.	

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you could collect review or provide feedback on?	Some Types of Written	Work in Amplify Science
ome Types of Written Work in Amplify Science to the right for guidance. re isn't a work product listed above, do you want to add one? Make notes below. <u>ynchronous</u> : students jot down their initial ideas <u>inchronous</u> : record observations of dolphin sounds.	 Daily written reflections Homework tasks Investigation notebook pa Written explanations (typi Diagrams Recording pages for Sim u 	ges cally at the end of Chapter) ises, investigations, etc
will students submit this work product to you?	Completing Written Work	Submitting Written Work
ints can complete and submit work. <u>Anchronous</u> : students jot initial ideas on paper or digitally to Ing with them to the asynchronous lesson <u>inchronous</u> : Students will use the student sheets to record eir observations and complete the pre unit assessment and bmit through Schoology.	 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

 Daily written reflections Daily written reflections Homework tasks Investigation notebook pages Written explanations (typically at the end of Chapter) Diagrams Recording pages for Sim uses, investigations, etc Vill students submit this work product to you? the Completing and Submitting Written Work tables to the right for guidance on how ents can complete and submit work. Synchronous: students jot initial ideas on paper or digitally to 'ing with them to the asynchronous lesson ynchronous: Students will use the student sheets to record leir observations and complete the pre unit assessment and ubmit through Schoology. Completing multiply through Schoology. Daily written reflections Horework tasks Investigation notebook pages Written explanations (typically at the end of Chapter) Diagrams Recording pages for Sim uses, investigations, etc Completing Written Work Submitting Written Work	ook at the <i>Students will</i> columns. What are students working in the lesson(s)	Some Types of Written	Work in Amplify Science
 w will students submit this work product to you? the Completing and Submitting Written Work tables to the right for guidance on how ents can complete and submit work. Synchronous: students jot initial ideas on paper or digitally to ring with them to the asynchronous lesson Anchronous: Students will use the student sheets to record ieir observations and complete the pre unit assessment and ubmit through Schoology. Completing 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) (6-8) Hand-in button on student platform 	The sourcould collect, review, or provide feedback on? The some Types of Written Work in Amplify Science to the right for guidance. There isn't a work product listed above, do you want to add one? Make notes below. <u>Asynchronous</u> : students jot down their initial ideas <u>Synchronous</u> : record observations of dolphin sounds.	 Daily written reflections Homework tasks Investigation notebook pa Written explanations (typi Diagrams Recording pages for Sim to 	ages ically at the end of Chapter) uses, investigations, etc
 Plain paper and pencil (videos include prompts for setup) Plain paper and pencil (videos include prompts for setup) 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 Gogle Classroom, etc) Ge-8) Student platform Investigation Notebook Becord video or audio file describing work/answering prompt Ge-8) Student platform During in-school time (hybrid model) or lunch/materials pick-up times 	ow will students submit this work product to you? the Completing and Submitting Written Work tables to the right for guidance on how	Completing Written Work	Submitting Written Work
	Asynchronous: students jot initial ideas on paper or digitally to bring with them to the asynchronous lesson <u>Synchronous</u> : Students will use the student sheets to record their observations and complete the pre unit assessment and submit through Schoology.	 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
	 Supports: Encourage students to engage in student-to-student discussion Provide students with the Multi-Language Glossary where apprendered to the students with the Multi-Language Glossary where apprendered to the students of t	n ropriate, add images uss time to talk about the dol vert sounds into visual repres	phin sounds. sentations of waveforms.



Collaborative Planning



pages 14-17

Breakout groups

Discussion prompts

Planning:

• Dig into the @Home Resources for lesson 2. Discuss what you will prioritize for synchronous vs. asynchronous time

Student work:

• Discuss how you can collect evidence of student work

Differentiation:

• Consider how you might differentiate the lesson for diverse learners

Day 2:				
Minutes for science:		Minutes for science:		
Asynchronous Synchronous		Asynchronous Synchronous		
Lesson or part of lesson:		Lesson or part of lesson:		
Mode of instruction: Preview Review Teach full lesson live Teach using synchronous su Students work independent @Home Packet @Home Sildes and @Hi @Home Videos	uggestions Jy using: orme Student Sheets	Mode of instruction: Preview Review Teach full lesson live Teach using synchronous : Students work independer GHome Packet GHome Sildes and GHome Videos	suggestions ntly using: Home Student Sheets	
Students will	Teacher will	Students will	Teacher will	
				ork in Amplify Science s ily at the end of Chapter) s, investigations, etc
				ubmitting Written Work
	How will you differentiate this	lesson for diverse learners? (Navgate to the	tor setup) (6-8) Student platform Investigation Notebook Record Video or audio f describing work/answering promp • Teacher-created digital format (Google Classroom, etc) Hesson level on the standard Angliy Science platform	Take a picture with a smartphone and email or text to teacher Through teacher-created digital format (hybrid model) or turns jin-school time (hybrid model) or turns (6-8) Hand-in button on student platform and click on differentiation the left menu.)

pages 14-17

Breakout groups

Please choose a person from your group to share out!

Planning:

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

Student work:

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

Differentiation:

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

ay 2:				
inutes for science:	-	Minutes for science:		
structional format: Asynchronous Synchronous		Asynchronous Synchronous		
sson or part of lesson:		Lesson or part of lesson:		
ode of instruction: Preview Review Teach fulllesson live Teach using synchronous sugge Students work independently us @Home Packet @Home Pideas @Home Videos	stions sing: Student Sheets	Mode of instruction: Preview Review Teach full lesson live Students work independenty @Home Placket @Home Sides and @Ho @Home Videos	ggestions y using: yme Student Sheets	
udents will	Teacher will	Students will	Teacher will	
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H	ow will you differentiate this lesson	for diverse learners? (Navgate to the le	(6:8) Studen hole book (6:8) Studen Notebook mcstgation Notebook describing work/answering prompt Teacher-created digital format (Google Classroom, etc) son livel on the standard Anglify Science platform and	Through teacher-created digital format digital format (hybrid model) or (hybrid model) or (hybrid model) or (hybrid model) or (hybrid model) or (hybrid model) or times (6:8) Hand-in button on student platform I dick on differentiation in the left menu.)








Plan for the day

- Framing the day
 - Remote learning reflection
 - Revisiting the Amplify Approach

• Phenomenon at the unit level

- Navigation refresher (standard curriculum)
- Storyline and science concepts
- Unit internalization work time

• Planning to teach

- Navigation refresher (@Home resources)
- Lesson walkthrough
- Collaborative planning time
- Closing
 - Reflection & survey

Head or hands reflection

Reflect independently, then volunteer to share

Based on our work today....

Head: What will you keep in mind while you plan?

Hands: What will you do when you're teaching?



During this workshop did we meet our objectives? Do you feel able to...

- Describe how students' conceptual understanding builds through the unit?
- Explain how students figure out the phenomenon throughout the unit?
- Make a plan for implementing Amplify Science within your class schedule and instructional format?



Final questions?



Upcoming LAUSD Office Hours Twice Monthly on Thursdays, 4:30-5:30pm:

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

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





Benchmark Assessments

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

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

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



Program Hub: Self Study Resources



Additional Amplify resources



Program Guide

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

https://cascience.wpengine.com/conte nt/welcome-k-8/integrated-model/

Amplify Help

Find lots of advice and answers from the Amplify team.

my.amplify.com/help



Additional Amplify Support

Customer Care

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



scihelp@amplify.com



Amplify Chat

When contacting the customer care team:

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

Creating Assignments in Schoology

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

LAUSD Shared Logins

AmplifyScience

Go to: my.amplify.com

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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	