Amplify Science

Metabolism Unit Deep Dive

Grade 6

LAUSD Date: September, 2023 Presented by



Opening Reflection

What are your goals for student outcomes as a result of attending this professional workshop?

Participant Notebook

Reflection

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

Session goals and student outcomes

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

Name Amplify Facilitator

- Add your experience here.

[Insert Photo]

For an easy way to do it:

- Right click on **this** image.
- Click "Replace Image."
- Choose how you'll upload your image.
- Reposition your photo if necessary.

Please write your name on the index card.



Amplify's Purpose Statement

Dear teachers,

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

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

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

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

Sincerely, Amplify

Norms: Establishing a culture of learners

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

Today's Logistics



- Lunch break from 11:30 12:30
- The day ends at 3:00
- Please be sure to sign in
- Bathrooms
- Parking lot for questions or concerns
- If you need to stand, feel free to but please stay engaged





Join Amplify Science Schoology Group

To join Amplify Science Schoology MS Group: **SPG7G-K7BT9**



Logging in (demo account) Safari or Chrome

- 1. Go to learning.amplify.com
- 2. Select Log in with Google
- 3. If you're already logged in with other Google accounts, click **Use another account**
- 4. Enter teacher demo account credentials
 - californiasci_@pd.tryamplify.net
 - Password: AmplifyNumber1





LAUSD SUMMER SYMPOSIUM 2023

Session 1 Unit 1 Deep Dive









Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Digging into Chapter 2
- Planning
- Closing

Ice Breaker! Who do we have in the room today?

- Name & School
- Have you taught Amplify Science before and if so, for how long?
- What are your goals for student outcomes after attending this student workshop today?



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



Participant Notebook

PLPG **Amplify**Science Participant Notebook Grade 6: Metabolism **Unit Deep Dive**

Hardcopy and digital









Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Digging into Chapter 2
- Planning
- Closing

Goals for the day:

By the end of the day, you will:

- Experience how all the instructional components fit together in the context of the unit
- Gain a deeper understanding of the purposeful sequencing of each activity and lesson within a chapter
- Become more familiar with multimodal instruction and how it provides multiple at bats to support student success
- Use the Amplify curriculum and resources to prepare to teach



Course curriculum structure



Grade 7

- Launch: Geology on Mars
- Plate Motion
- Engineering Internship: Plate Motion
- Rock Transformations
- Phase Change
- Engineering Internship: Phase Change
- Chemical Reactions
- Populations and Resources
- Matter and Energy in Ecosystems

Grade 8

- Launch: Harnessing Human Energy
- Force and Motion
- Engineering Internship: Force and Motion
- Magnetic Fields
- Light Waves
- Earth, Moon, and Sun
- Natural Selection
- Engineering Internship: Natural Selection
- Evolutionary History

Key takeaways:

- 9 units per grade level
- 145 lessons total per year
- Lessons are 45 minutes long

Unit Overview







Phenomenon based learning



Phenomenon-based learning and teaching

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

Comparing topics and phenomena

Topic-based	Phenomenon-based
Ocean habitats	A sea turtle can survive in an ocean habitat where sharks live

Comparing topics and phenomena A shift in science instruction

from learning about

(like a student)



to figuring out

(like a scientist)

Phenomena-based Instruction

Inquire like a scientist. Think like a scientist. **Quantify** like a scientist. **Read** like a scientist. Talk like a scientist. Write like a scientist. **Critique** like a scientist. Argue like a scientist.

Figuring out phenomena like a scientist.

Previewing the unit Introducing the phenomenon

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

Let's look at the phenomenon, or observable event, students will figure out in your unit.



Today, we will begin a new unit called *Metabolism*.

We will start with a Warm-Up each day to get us thinking about science ideas. For today's Warm-Up, you will watch and respond to a video that introduces your new role as **medical students.**

- Elisa doesn't sleep enough
- Elisa doesn't get enough' vitamins
- Elisa eats too much junk food
- Elisa doesn't exercise enough
- Elisa has asthma
- Elisa has an infection

Sleep Issue?

Diet Issue?

Medical Condition?

Amplify Science Anchoring phenomenon

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



Pg. 4

Unit Overview

	Anchor phenomenon			
3-dimensional learning students	engage with to explain	the anchor p	ohenomenon:	
DCIs: What scientists want to know	SEPs: What scientists do		CCCs: How scientists th	ink
Learning that occurs in Chapter 1		Learning that	at occurs in Chapter 2	
Learning that occurs in Chapter 3	6	Learning that	at occurs in Chapter 4	
	andings and preconce	ptions		
Science Background: Key underst	arrentiga una preconce			

CORE Unit

Metabolism

Problem: What is causing Elisa, a young patient, to feel tired all the time?

Role: Medical Students

In this unit, students in the role of medical students, are able to draw the connections between the large-scale, macro-level experiences of the body and the micro-level processes that make the body function.

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Coherent storylines



Chapter 1: Molecules Needed by the Cells

3 Lessons

Why does Elisa feel tired all the time?



Chapter 2: Body Systems

7 Lessons

What is happening in Elisa's body that could be preventing molecules from getting to her cells?



Chapter 3: Cellular Respiration

5 Lessons

How do molecules in the cells of the body release energy?



Chapter 4: Metabolism and Athletic Performance

4 Lessons

Students apply what they learn to a new question—How did the athlete increase his cellular respiration and improve his performance?

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Navigating to the Unit Map

19 Lessons Metabolism		19 Lessons Metabolism			
Printa	ble Teacher Guide 🔻	Printab	le Teacher Guide 🔻		
Unit Overview Chapters Printable Resources Planning for the Unit ~ Teacher References ~ Offline Preparation	Unit Ove What's in This Through inhold metabolism of w body and the mi body systems ar human body with Read more	Unit Overview Chapters Printable Resources Planning for the Unit A Unit Map Progress Build Getting Ready to Teach Materials and Preparation Science Background Standards at a Glance Teacher References A	Unit Overview What's in This Unit? Through inhabiting the role metabolism of world-class body and the micro-level pr body systems are not work human body with the mole Read more > Chapters	V of medical stude athletes—are able rocesses that mak- ing properly, stud cules they need. B	
	Chapter 1: Chapter 1:	Lesson Overview Compilation Standards and Goals 3-D Statements Assessment System Embedded Formative Assessments Articles in This Unit Apps in This Unit Opportunities for Unit Extensions in This Unit Offline Preparation	Chapter 1: Molecu	les Needed I LESSON 12 Welcome	

Unit Map

What is causing Elisa, a young patient, to feel tired all the time?

Through inhabiting the role of medical students in a hospital, students are able to draw the connections between the large-scale, macro-level experiences of the body and the micro-level processes that make the body function as they first diagnose a patient and then analyze the metabolism of world-class athletes. They uncover how body systems work together to bring molecules from food and air to the trillions of cells in the human body.

-

Chapter 1: Why does Elisa feel tired all the time?

Students figure out: Elisa feels tired because her cells aren't getting the molecules they need from food and air, which are necessary for her cells to function, grow, and repair.

How they figure it out: They make observations in the Simulation and read a short article to discover which molecules are taken in by the cells.

Chapter 2: What is happening in Elisa's body that could be preventing molecules from getting to her cells?

Students figure out: Elisa's cells are getting enough oxygen and amino acids, but not enough glucose. Her digestive system should break down starch molecules into glucose molecules, which are small enough to get into cells, and her circulatory system should deliver the glucose to cells. Students diagnose Elisa with diabetes.

How they figure it out: They explore several medical conditions with the Sim and through text. They conduct a hands-on investigation and participate in a Classroom Body Systems Model. They explain how diabetes affects Elisa's body systems and the molecules that get to her cells.

Chapter 3: How do molecules in the cells of the body release energy?

Students figure out: Elisa feels tired because her cells need both glucose and oxygen to release energy, in a process called cellular respiration.

How they figure it out: They explore the effects of activity on their own bodies, observe a chemical reaction that represents a model of cellular respiration, read an article, and conduct additional investigations in the Simulation.

Chapter 4: Students apply what they learn to a new question-How did the athlete increase his cellular respiration and improve his performance?

Students consider cellular respiration in the context of high-performance athletes, and read an article about a controversial practice called blood doping, which is used to enhance athletic performance, Jordan Jones finished 35th in a competitive bike race last year and 1st in a similar race this year. Was he blood doping? Students consider alternative claims and review the available evidence to make an argument. They engage in oral argumentation in a student-led discourse routine called a Science Seminar and then individually write their final arguments.

Amplify Science Approach

Introduce a **phenomenon** and a related problem Collect **evidence** from multiple sources Build increasingly complex **explanations** **Apply** knowledge to solve a different problem

S

Multimodal instruction

For each key concept, students work with evidence in varied modalities.




Navigating to the Coherence Flowchart

19 Lessons Meta ₽ Print	eacher Guide	
Unit Overview Chapters Printable Resources	^U Printable Resources	
Planning for the Unit \checkmark	me 📴 3-D Assessment Objectives	Coherence Flowchart
Teacher References ∨ Offline Preparation	boo 📴 Copymaster Compilation	Flextension Compilation
	Re 👜 Investigation Notebook with Article Co	ompilation 👘 NGSS Information for Parents and Guardians
	C C C C C	Print Materials (11" x 17") or Knowledge, Personal Experiences, and Cultural Backgrounds
	LESSON 1.1 Pre-Unit Assessment Welcome to Medical School	L3 ing Initial Claims Elisa Amplify 1

Metabolism & NGSS

Using 3-D teaching and learning for figuring out phenomena



Navigating to the 3-D Statements

19 Lessons Metal	bolism le Teacher Guide		19 Lessons Metab	oolism • Teacher Guide			
Unit Overview Chapters Printable Resources Planning for the Unit ~ Teacher References ~ Offline Preparation	Unit Overview What's in This Unit? Through inhabiting the role of medical s metabolism of world-class athletes—ar body and the micro-level processes tha body systems are not working properly. human body with the molecules they no	Unit Over Chapters Printable Planni Un Pro Ge Ma	erview e <u>e Resources</u> 3-D State Unit Level	Unit Overview What's in This Unit? ements		E Key Practices Disciplinary Core Ideas Crosscuttin	ng Concepts
	Read more > Chapters Chapter 1: Molecules Need	Sci Sta Teache Les Coi Sta 3-C Ast	As students firs make connectio investigations— construct expla cells with the m	t diagnose a patient ar ons—through the use o between <mark>macroscale anations</mark> about <mark>how boo olecules they need for</mark>	nd then engage in argur of physical and digital m and microscale process dy systems work togeth cellular respiration (en	mentation about an athlete's improved perform nodels, articles, videos, and hands-on ses in the body (scale, proportion, and quantity ner (systems and system models) to provide th nergy), growth, and repair (energy and matter)	nance, they /). Students ne body's
	EESSON 1.1 Pre-Unit Assessment	Embe Asses Articl Apps Oppor Exten Flexte Offline P	les in This Unit in This Unit in This Unit rutunities for Unit nsions ensions in This Unit Preparation	SETTINGS LESSON 1.1 Pre-Unit Assessment Chapter 2: Body Syst	LESSON 1.2 Welcome to Medical School ems ^①	LESSON 1.3 Evaluating Initial Claims About Elisa	.mplif y 3

Disciplinary Core Ideas: Patterns of Earth and Sky

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



Science and Engineering Practices Patterns of Earth and Sky

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

 - 5. Using mathematics and computational thinking
 - 6. Constructing explanations (for science) and designing solutions (for engineering)
 - 7. Engaging in argument from evidence
 - 8. Obtaining, evaluating, and communicating information

math anguage

inquiry

Crosscutting Concepts: Patterns of Earth and Sky

Crosscutting Concepts

- . Cause and Effect
- 2. Structure and Function
 - 3. System and System Models 🏏
 - 4. Scale, Proportion and Quantity 🗸
 - 5. Stability and Change
- 6. Energy and Matter 🗸
- 7. Patterns

Metabolism: 3D Statements

3-D Statements

Key

Practices Disciplinary Core Ideas Crosscutting Concepts

Unit Level

As students first diagnose a patient and then engage in argumentation about an athlete's improved performance, they make connections—through the use of physical and digital models, articles, videos, and hands-on investigations—between macroscale and microscale processes in the body (scale, proportion, and quantity). Students construct explanations about how body systems work together (systems and system models) to provide the body's cells with the molecules they need for cellular respiration (energy), growth, and repair (energy and matter).

Navigating to the Materials and Preparation



Metabolism Planning for the Unit Materials and Preparation Materials at a Glance Note: Check and follow your district's safety regulations pertaining to the use procedures for students participating in hands-on science activities. Please re California Public Schools, California Department of Education [2014]. Items Provided in the Metabolism Kit This is a complete list of all the kit-provided materials needed to present the e class of 40 students. For reordering information, call Amplify at 1 (800) 823-1 Note: Your Amplify Science kit may contain additional quantities of some item Quantity needed Manipulatives 50 bags, plastic, with zip* 50 teaspoons baking soda* 10 bottles, 60 mL, filled with phenol red* 50 tablespoons calcium chloride* 10 cylinders, graduated, 25 mL 1 measuring spoon, tablespoon measuring spoon, teaspoon 200 pipe cleaners, green 150 pipe cleaners, purple 75 pipe cleaners, yellow stopwatch *consumable item

1



Metabolism Planning for the Unit Materials and Preparation

1	spoon, large	3.3
1	stir sticks, beverage, wooden, flat*	3.3
1	tape, masking, roll*	3.3
1	timer (or clock with second hand)	3.3
2	trash bins (or other container for cup disposal)	3.3
20	trays	3.3
2 (about)	water, room temperature, liters*	3.3
11 (about)	water, very cold, liters*	3.3
2 (about)	water, very warm, liters*	3.3

*consumable item

Preparation at a Glance

The information provided here is an overview of the amount of time we estimate it will take you to prepare the materials for each lesson of the Metabolism multi. This does not include the time you will need to spent reading the instructional guide, previewing the student activities, articles, or videos; or reviewing students' work. The Materials and Preparation sections in the Lesson Birl of each lesson (in the instructional guido) include called preparation steps to be completed before the day of each lesson as well as steps to be done immediately before each lesson. This preparation time is summarized in the tables below to assist in your planning. We suggest actually called after gover lessons, tabing particular role of the lessons that require more preparation time. Note: Amount of time listed for each lesson is the total estimated anound of preparation time needed and not just the time for any self-contained table), listed.

Chapter 1

Lesson	Title	Preparation time frame (in minutes)
11	Pre-Unit Assessment	10: This lesson can be taught without digital devices.
12	Welcome to Medical School	10: Students use digital devices in this lesson.

5

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Explore or review the key planning documents

Chapters

Printable Resources

Planning for the Unit ~

Teacher References ∨

Offline Preparation

Spend a few more minutes exploring or reviewing the documents on the Unit Landing Page.



Unit Overview

What's in This Unit?

Through inhabiting the role of medical students in a hospital, students—as they first diagnose a patient and then analyze the metabolism of world-class athletes-are able to draw the connections between the large-scale, macro-level experiences of the body and the micro-level processes that make the body function. By investigating the anchor phenomenon-a patient whose body systems are not working properly, students learn how body systems work together to provide the trillions of cells in the

Read more >

Chapters

Chapter 1: Molecules Needed by the Cells ①







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LESSON 1.3 **Evaluating Initial Claims** About Elisa

LESSON 1.1

Pre-Unit Assessment

LESSON 12 Welcome to Medical School **Explaining the phenomenon: Science Concepts**

Metabolism

Unit Question: How do the trillions of cells in the human body get what they need to function, and what do the cells do with the things they absorb?

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Navigating to the Lesson Overview Compilation

19 Lessons Metabolism	n 19 Lessons	haliam			
Printable Teacher G	iuide	ble Teacher Guide 👻	Unit Overview Chapters Printable Resources Planning for the Unit A	Lesson Overview Compilation Lessons in This Unit Chapter 1 Lessons Lesson 1: Pre-Unit Assessment	
Unit Overview Unit Chapters What's Unit Printable Resources What's I Planning for the Unit ~ Through metaboli body and Offline Preparation body sys human b Read m Chapt Chapt	Overv in This Unit inhabiting ti sm of world the micro-liters terms are no odv with the progress Build Getting Ready to Teach Materials and Preparation Science Background Standards at a Glance Teacher References ^ Lesson Overview Compilation Standards and Goals 3-D Statements Assessment System Embedded Formative Assessment System Embedded Formative Assessment System Embedded Formative Assessment System Embedded Formative Assessment System Embedded Formative Assessments Articles in This Unit Opportunities for Unit Extensions Entert Intis Unit Standards and This Unit Compilation Standards and This Unit Standards and This Unit Apps in This Unit Standards and This Unit Apps in This Unit Standards and This Unit Apps in This Unit Standards and This Unit Standards and This Unit Apps in This Unit Standards and This Unit Apps in This Unit Standards and This Unit Apps in This Unit Standards and This Unit Standards and This Unit Apps in This Unit Standards and Standards Standards and Standards St	Unit Ove What's in This I Through inhabitin metabolism of wo body and the mic body systems are human body with Read more > Chapters Chapter 1: N Settings LESSON 11 Pre-Unit Assess	Unit Map Progress Build Getting Ready to Teach Materials and Preparation Science Background I Standards at a Glance Teacher References ^ Lesson Overview Compilation Standards and Goals 3-D Statements Assessments Articles in This Unit Opportunities for Unit Extensions in This Unit Offline Preparation	Lesson 1.1: Pre-Volum Assessment Lesson 1.2: Welcome to Medical School Lesson 1.3: Evaluating Initial Claims About Elisa Chapter 2 Lessons Lesson 2.1: Exploring the Classroom Body Systems Model Lesson 2.2: Conducting Sim Tests Lesson 2.4: Conducting Sim Tests Lesson 2.4: Conducting Sim Tests Lesson 2.6: Praying Guess My Model Lesson 2.7: Diagnosing Elisa Chapter 3 Lessons Lesson 3.1: Learning About Energy Release in the Body Lesson 3.1: Carbing Carbing Clauser My Model Lesson 3.1: Carbing Clauser My Model Lesson 3.1: Carbing Clauser My Model Lesson 4.1: Giolog Gorgio: A Cycling Champion's Story Lesson 4.1: Going for Gold: A Cycling Champion's Story Lesson 4.2: Analyzing Evidence Lesson 4.4: End-of-Unit Assessment Chapters at a Glance Unit Question How do the trillions of cells in the human body get what they need to function, and what do the cells do with the things absorb? Chapter 1: Molecules Needed by the Cells	they
LESSON 1. Pre-Unit	1 rextensions in This Unit t Assessme Offline Preparation	Chapter 2: E		Chapter Question Why does Elisa feel tired all the time?	Amn

Explaining the phenomenon: Science Concepts

Metabolism

Unit Question: How do the trillions of cells in the human body get what they need to function, and what do the cells do with the things they absorb?

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

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Navigating to the Progress Build



Progress Build

Each Amplify Science Middle School unit is structured around a unit-specific learning progression, which we call the Progress Build. The unit's Progress Build describes the way students' explanatory understanding of the unit's focal phenomena is likely to develop and deepen over the course of a unit. It is an important tool in understanding the structure of a unit and in supporting students' learning; it organizes the sequence of instruction (generally, each level of the Progress Build corresponds to a chapter), defines the focus of assessments, and grounds the inferences about student learning progress that guide suggested instructional adjustments and differentiation. By aligning instruction and assessment to the Progress Build (and therefore to each other), evidence about how student understanding is developing may be used during the course of the unit to support students and modify instruction in an informed way.

The Metabolism Progress Build consists of three levels of science understanding. To support a growth model for student learning progress, each level encompasses all of the ideas of prior levels and represents an explanatory account of unit phenomena, with the sophistication of that account increasing as the levels increase. At each level, students add new ideas and integrate them into a progressively deeper understanding of how body systems work together to provide cells in the human body with the molecules they need. Since the Progress Build reflects an increasingly complex yet integrated explanation, we represent it by including the new ideas for each level in bold.

Prior knowledge (preconceptions). At the start of the Metabolism unit, middle school students will likely know that eating and breathing are necessary for life, but will know little about the specifics of why these activities allow our bodies to function. Students may associate eating with gaining energy, but will not know that oxygen is also required for energy release. Students may know about the process of digestion, but are unlikely to know what happens to food after it is digested. Depending on previous instruction, some students may know about cells. Additionally, students will know that a body has blood and a heart, but will not generally know how these contribute to a body's ability to function. This experience and prior knowledge can be built on and refined, which the Metabolism Progress Build and unit structure are designed to do.

Progress Build Level 1: Cells in the body need molecules from outside to function.



The body can function when the cells of the body are getting and using molecules that come from outside the body-from the food we eat and the air we breathe. Oxygen, glucose, and amino acids are molecules the cells need that come from outside the body.

Progress Build Level 2: Systems in the body work together to take in, break down, and deliver needed molecules to the cells.

The body can function when the cells of the body are getting and using molecules that come from outside the body-from the food we eat and the air we breathe. Oxygen, glucose, and amino acids are molecules the cells need that come from outside the body. The digestive system breaks down starch and protein molecules from food into glucose and amino acids, and then the circulatory system transports these molecules to the cells. Also, the respiratory system takes in oxygen molecules from the air, and the circulatory system transports those molecules unchanged to the cells because oxygen molecules are already small enough to fit into cells.

Progress Build Level 3: Cells can use these molecules to release energy for the body to function.

The body can function when the cells of the body are getting and using molecules that come from outside the body-from the food we eat and the air we breathe. Oxygen, glucose, and amino acids are molecules the cells need that come from outside the

8

Progress Build

A Progress Build describes the way in which students' explanations of the central phenomenon should 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 and defines the focus of the assessments.**



Amplify

Unpacking the Progress Build

Understanding a unit's Progress Build will help you guide your students, address misconceptions, and avoid giving ideas away too early in the unit.

In this activity, you'll use the Progress Build.



Metabolism Progress Build

Prior knowledge (preconceptions): At the start of the *Metabolism* unit, middle school students will likely know that eating and breathing are necessary for life, but will know little about the specifics of why these activities allow our bodies to function.

Level 3

Level 2Level 1Systems in the body work
together to take in, break
down, and deliver needed
molecules from outside to
function.Cells can use these molecules
to release energy for the body to
function.

Unpacking the Progress Build Group Work time

The purpose of this next work time is to understand what the levels of the Progress Build are in this unit, and reinforce understanding of its science concepts.



Progress Build analysis

Group work time

• With your group or partner, create a visual representation of all the levels of your unit's progress build.



Progress Build analysis Presentations

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Questions?









Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Digging into Chapter 2
- Planning
- Closing

Metabolism: Chapter 1

Chapters

Chapter 1: Molecules Needed by the Cells ③



LESSON 1.1 Pre-Unit Assessment



LESSON 1.2 Welcome to Medical School



LESSON 1.3 Evaluating Initial Claims About Elisa

Digging in to chapter 1

Group Work time

- 1. Form groups of 2, 3 or 4
- 2. Each group will pick a lesson in Chapter 1 (1.2 - 1.3)
- 3. Chart the activities in the lesson. Be sure to include:
 - a. Purpose of lesson
 - b. Modalities of each activity (do, talk, read, write or visualize)
 - c. Vocabulary introduced
 - d. Key Concepts introduced



Purpose of the lesson

Classroom Slides



Modalities



The Lesson Brief

Coherence Flowchart

Amplify.

Vocabulary



Materials &

Preparation

Standards

Vocabulary

Unplugged?

Differentiation

Overview

Students participate in a classroom-sized model of the human body in which students play the roles of body systems delivering molecules (represented by pipe cleaners) to cells. This kinesthetic experience demonstrates the important role that each body system plays in bringing necessary molecules to the body's cells. The digestive system breaks down starches and proteins into glucose and amino acid molecules. The respiratory system brings in oxygen molecules from air. The circulatory system connects the digestive and respiratory systems to the cells, transporting these molecules to all the cells in the body. This memorable classroom body systems model helps students understand the body as a system made of subsystems, which ultimately transports the necessary molecules to all the cells in the body.

Digital Resources

- Classroom Slides 2.1 | PowerPoint
- E Classroom Slides 2.1 | Google Slides
- All Projections
- Classroom Videos 2.1 | Zip
- Classroom Map for Model Setup
- Hideo: Body Systems Model
- Metabolism Investigation Notebook, pages 20-24

Materials & Preparation

Materials

For the Classroom Wall

- Chapter 2 Question: What is happening in Elisa's body that could be preventing molecules from getting to her cells?
- · vocabulary card: system
- key concept: Cells can only use molecules that are small enough to enter a cell.
- · key concept: The respiratory system brings in oxygen molecules from the air. These oxygen molecules are already small enough to fit into cells.
- · key concept: The digestive system brings in food and breaks it down into smaller molecules, such as glucose and amino acids, that can fit into cells.
- key concept: The circulatory system transports glucose, oxygen, and amino acid molecules to every cell in the body.

Lesson Brief:

Key Concepts Chapter 2: Body Systems Unit Overview Chapter Q Chapters Materials & Preparation Overview Metabolism: Making the Diagnosis Printable Resources Materials & What is has Preparation Materials Problem Students What is causing Elisa, a young patient, to feel tired all the Planning for the Unit ~ Work to Solve Investigati Differentiation Standards Teacher References ^ For the Classroom Wall How do Vocabulary **Chapter 1** Question Why does Elisa feel tired all the time? Lesson Overview Unplugged? Compilation Chapter 2 Question: What is happening in Elisa's body that could How ca Standards and Goals be preventing molecules from getting to her cells? Investigation What does the human body need to function? Key Conce 3-D Statements Questions (1.2) vocabulary card: system Assessment System Cells ca key concept: Cells can only use molecules that are small enough Evidence Sources Investigate molecules in the Sim (1.2) **Embedded Formative** and Reflection • Test diets in the Sim (1.2) Assessments The res to enter a cell. Opportunities Articles in This Unit cells. (2 key concept: The respiratory system brings in oxygen molecules Apps in This Unit The dige Students figure out: from the air. These oxygen molecules are already small enough to **Key Concepts** · The body takes in molecules by eating and **Opportunities for Unit** into cel fit into cells. breathing. (1.2) Extensions Some of these molecules travel to the cells of the body. (1.2) Flextensions in This Unit The circ key concept: The digestive system brings in food and breaks it Offline Preparation down into smaller molecules, such as glucose and amino acids, In a fun that can fit into cells. Application of Key the bod Evaluate evidence and claims about Elisa (1.3) **Concepts to Problem** key concept: The circulatory system transports glucose, oxygen, System and amino acid molecules to every cell in the body. Explanation That Students Can A prob Elisa's cells need molecules from food like glucose and a Make to Answer she is tired all of the time her cells may not be getting w the Chapter 1 (2.4)Ouestion

Coherence Flowchart Lesson Overview Compilation

Materials and Preparation Amplify.

Digging in to chapter 1

Group Work time

- 1. Form groups of 2, 3 or 4
- 2. Each group will pick a lesson in Chapter 1 (1.2-1.3)
- 3. Chart the activities in the lesson. Be sure to include:
 - a. Purpose of lesson
 - b. Modalities of each activity
 - c. Vocabulary introduced
 - d. Key Concepts introduced



Presentations



Chapters

Chapter 1: Molecules Needed by the Cells 🛈



LESSON 1.1 Pre-Unit Assessment



LESSON 1.2 Welcome to Medical School



LESSON 1.3 Evaluating Initial Claims About Elisa



Break











Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Digging into Chapter 2
- Planning
- Closing

Metabolism: Chapter 2

Chapter 2: Body Systems ③



LESSON 2.1 Exploring the Classroom Body Systems Model



LESSON 2.2 Patient Stories: Problems with Body Systems



LESSON 2.3 Learning More About a Condition



LESSON 2.4 Conducting Sim Tests



LESSON 2.5 Critical Juncture Assessment



LESSON 2.6 Playing Guess My Model



LESSON 2.7 Diagnosing Elisa

4 Easy Steps to teaching a lesson

DIRECTIONS:

- Download the Classroom Slides for Lesson 1.1 and review them.
- 2. Read the Overview.
- 3. Explore the Materials & Preparation document.
- 4. Read the **Differentiation** document.



Unit: Metabolism Lesson: 2.1

Purpose: Lesson purpose: To help students understand the body as a system made of subsystems, which ultimately transports the necessary molecules to all cells in the body.

Materials and Preparation:

Day Before the Lesson:

- 1. Set aside Chapter 2 question: "What is happening in Elisa's body that could be preventing molecules from getting to her cells?"
- 2. Set aside vocabulary word card: system
- *3. Set aside 4 key concept cards.*
- 4. Prepare starch, protein and oxygen molecules with colored pipe cleaners
- 5. Set up stations for th Body Systems Model: Environment, Small Intestine, Lungs, Brain Cell, Leg-Muscle, and injured Are-Muscle Cell stations
- 6. Prepare Alveoli, Villi, and Cell Membrane cards

Immediately Before the Lesson:

- 1. Write the Investigation Question on the board or a sentence strip "How do molecules from food and air get to the cells in the body?"
- 2. Write the name of the constellation on the board-a constellation that students will investigate that is visible during time of lesson.
- 3. Have materials available:
 - Digital devices
 - Sets of Role Cards, in envelopes
 - Heart Failure Cards

Metabolism Unit Question: How do the trillions of cells in the hyman Key Vocabulary body get what they need to Concepts function, and what do the cells metabolism do with the things they **#1-** A functioning human molecule absorb? body has molecules from amino acid food (glucose and amino Chapter 1 Question: why acids) and molecules glucose does Elisa feel tried all the from air (oxygen) in its time? oxygen cells. Investigation Question: What does the human body need to function? Investigation Question: Which molecules do cells need to function?
Metabolism

Lesson 2.1: Exploring the Classroom Body Systems Model

AmplifyScience

Activity 1 Warm-Up



Activity 1

Warm-Up

- 1. Launch the *Metabolism* Simulation.
- 2. Select HEALTHY BODY.
- 3. Select OBSERVE.
- 4. Focus on *just* oxygen by pressing on the other molecules at the bottom of the screen to hide them.
- 5. Observe and describe how oxygen moves through different parts of the body.

What do you notice about the path oxygen molecules take inside the *Metabolism* Simulation of a healthy body? Describe in detail.



Activity 2 Introducing the Classroom Body Systems Model

Today, we will investigate this question:

Investigation Question: How do molecules from food and air get to the cells in the body? We'll use a **new model** to help investigate our question. The Sim is a computer model.

Today, we'll create a different kind of model: a classroom-sized **physical model** of the systems in the human body that transport molecules to and from cells.



You will work in groups of four. Each group member will play a role in the model based on a Role Card. Three people will play the three **body** system roles, and one will play a **cell role**.



Each group will choose just ONE of the three cell cards.



Choose which type of cell one of your group members will represent in your model. 

Introducing the Classroom Body Systems Model

Classroom Body Systems Model





RESPIRATORY SYSTEM

CIRCULATORY SYSTEM





molecules. The different colors represent different types of molecules. Large molecules are represented by several pipe cleaners twisted together.

Pipe cleaners represent



We will use index cards with holes to represent the tiny openings that molecules pass through. There are three types of openings in the model: openings in villi, alveoli, and the cell membrane.



In the **Digestive System** role, you will take one food molecule at a time, break it down into smaller molecules, and then **deliver these** molecules to the circulatory system.



In the **Respiratory** System role, you will take one oxygen molecule at a time from the **Environment Station and deliver** it to the circulatory system.



In the Circulatory System role, you will pick up molecules at the Lungs Station and Small Intestine Station and carry them to one of the three cell stations.



In any of the **cell roles**, you will try to collect the molecules you need by communicating with the circulatory system and requesting specific molecules mentioned on your cell cards.

Classroom Map for Model Setup



cells need.



Let's watch an animated video that shows you a little bit more about these structures and how they will be represented in the model.

Remember, the model will help us investigate this question:

Investigation Question: How do molecules from food and air get to the cells in the body?

Body Systems Model Reflection Questions

- What did you do in your role in the classroom body systems model?
- What did you learn about this body system or the cells in the body from participating in the model?

Activity 3 Running the Model



Now we're ready to run the **Classroom Body Systems Model**.

Let's review the way our classroom is set up and how to run the model. 

Running the Model





Run the Model









Digestive System Start at: Environment Station Respiratory System Start at: Environment Station

Goal: Carry molecules from the Environment Station to the Small Intestine Station.

Goal: Carry molecules from the Environment Station to the Lungs Station. **Circulatory System**

Start at: Lungs or Small Intestine Stations

Goal: Carry molecules from the Lungs and Small Intestine to the Cells.

Cell Stations

Start at: the station matching your cell

Goal: Collect and send signals about the molecules needed.



Activity 4 Debriefing the Model





Debriefing the Model

Body Systems Model Reflection Questions

• What did you do in your role in the classroom body systems model?





Let's hear from someone who played each role, starting with the digestive system.

What did you **do** in your role in the classroom body systems model?

What did you **learn** about this body system or the cells in the body from participating?

 The digestive system brings in food and breaks it down into smaller molecules, such as glucose and amino acids, that can fit into cells.

 The respiratory system brings in oxygen molecules from the air. These oxygen molecules are already small enough to fit into cells.

5. The circulatory system transports glucose, oxygen, and amino acid molecules to every cell in the body.

2. Cells can only use molecules that are small enough to enter a cell.

2

What happened in the last few minutes of the model that **changed** how the body systems were working?

HEART FAILURE!

The patient represented in the model is now in heart failure, which means there is not enough blood flowing through his body. To **represent this in our model, please STOP participating in the model and sit down at your desk.** Observe the model carefully for the next few minutes to see what happens to the patient.

> Metabolism—Heart Failure Cards—Lesson 2.1—AMP615583.05-MET © The Regents of the University of California. All rights reserved.

In real heart failure, the heart cannot pump enough blood to **meet the cells' needs.**

Chapter 2 Question

What is happening in Elisa's body that could be preventing molecules from getting to her cells?

Activity 5 Homework





For this activity, you will **observe** the different body systems in the Sim and **answer questions** about what you observe.


Homework

Making Observations in the Sim

Make observations about how the different body systems work in the *Metabolism* Sim. Record your observations below. Then press NEXT to use what you learned—from your observations and the classroom body systems model—to continue this activity and answer questions about the body.

1. Launch the *Metabolism* Simulation, select HEALTHY BODY, and select OBSERVE.

2. Feed the body sandwiches (which provide a mix of molecule types).

3. Focus on what happens to starch in the digestive system.

• Turn off all the molecules except for starch and glucose. What do you observe?

Metabolism: Lesson 2.1

End of Lesson





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Metabolism CORE Unit

Through exploring the *Metabolism* Simulation, reading about different medical conditions, and participating in a classroom-sized model of the body, students learn that in a functioning body the digestive, respiratory, and circulatory systems work together to get glucose, oxygen, and amino acids to the cells. They explore the effects of activity on their own bodies and in the Simulation, and are then introduced to cellular respiration, the chemical reaction that releases energy in the cells. Students learn that the energy released in cellular respiration also supports growth and repair at the cellular level.

Lesson 2.1 Multimodal learning



Do Talk Read Write Visualize

Metabolism Lesson 2.1

Write: Warm-up

Students write about what they notice about the path oxygen molecules take inside the *Metabolism Simulation.*

Metabolism: Lesson 2.1	Activity 1
Warm-Up	
1. Launch the <i>Metabolism</i> Simulation. 2. Select HEALTHY BODY.	What do you notice about the path oxygen molecules take inside the <i>Metabolism</i> Simulation of
3. Select OBSERVE.	a healthy body? Describe in detail.
 Focus on <i>just</i> oxygen by pressing on the other molecules at the bottom of the screen to hide them. 	
5. Observe and describe how oxygen moves through different parts of the body.	

Metabolism Lesson 2.1

Visualize: Body Systems Model Video

- The whole class participates in the Mount Nose Model where each student takes on the role of Earth and investigates what an observer standing on his nose might see as the day progresses.
- Students use the Think-Write-Pair-Share discourse routine to reflect on the Mount Nose Model and discuss the patterns they observed.



Body Systems Model Video

Metabolism: Lesson 2.1

Do: Run the Classroom Body systems Model

Students will play a roles in the Classroom Body Systems Model, a physical model.



Metabolism Lesson 2.1

Talk: Debrief the Model

Students describe how the body systems work and refer to the interactions between parts of the system, and how systems work together to bring needed molecules to the cells. This an On-the-Fly assessment, formative assessment to monitor student understanding.

Metabolism: Lesson 2.1	Activity 4
Debriefing the Model	
Body Systems Model	
Reflection Questions	
 What did you do in your role in the classroom body systems model? 	
e the layers of the record of Calcum, 42 operations of	Investigation Notebook pg 22

Multimodal instruction (multiple at bats)

Activities of different modalities are intentionally sequenced to support deep understanding of complex concepts.



Lesson 2.1 Multimodal learning



Do Play roles in the Classroom Body Systems Model
Talk Debrief the Body Systems Model
Read
Write What they notice in the Metabolism Sim
Visualize Watch teh Body Systems Model Video

Reflection

How will multiple at-bats with multimodal evidence sources support diverse learners in your class to master complex science ideas?



Evidence sources work together

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



1. Enter

2. Breakdown







Questions?









Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
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- Planning
- Closing

Metabolism: Chapter 2

Chapter 2: Body Systems 🛈



LESSON 2.1 Exploring the Classroom Body Systems Model



LESSON 2.2 Patient Stories: Problems with Body Systems



LESSON 2.3 Learning More About a Condition



LESSON 2.4 Conducting Sim Tests



LESSON 2.5 Critical Juncture Assessment



LESSON 2.6 Playing Guess My Model



LESSON 2.7 Diagnosing Elisa

Digging into Chapter 2 Group Work time

- 1. In your group, pick a lesson in Chapter 2 (from 2.2 to 2.4)
- 2. Using the **classroom slides**, each group member will present an activity
- 3. Be prepared to **teach** at least 1 activity in the lesson.
- 4. Remember to state the purpose of the lesson



Presentations



Chapter 2: Body Systems ①



Exploring the Classroom

Body Systems Model



Patient Stories: Problems with Body Systems



LESSON 2.3 Learning More About a Condition



LESSON 2.4 **Conducting Sim Tests**

LESSON 2.1



LESSON 2.5 **Critical Juncture** Assessment





LESSON 2.6 Playing Guess My Model



LESSON 2.7 **Diagnosing Elisa**





Questions?



Goals for the day:

By the end of the day, you will:

- Experience how all the instructional components fit together in the context of the unit
- ✓ Gain a deeper understanding of the purposeful sequencing of each activity and lesson within a chapter
- Become more familiar with multimodal instruction and how it provides multiple at bats to support student success
- Use the Amplify curriculum and resources to prepare to teach

LAUSD SUMMER SYMPOSIUM 2023

Session 2 (after lunch) UCLA Center X Presentation



Lunch Break







LAUSD SUMMER SYMPOSIUM 2023

Session 3 Preparation, Planning & Pacing









Plan for the day

- Introduction and framing
- Unit Internalization
- Digging into Chapter 1
- Model Lesson
- Digging into Chapter 2
- Planning
- Closing

Planning Resources Links

Amplify Science Gr. 6 Metabolism Participant Links G6 PN Metabolism Deep Dive (pdf) Planning Resources Gr. 6 Metabolism Lesson Planning Slides (forced copy) G6 Metabolism Completed Material Prep Doc (forced copy) G6 Metabolism Investigation Questions Grade Sync from Classwork to Schoology Video Grade Sync from Classwork to Schoology Video Support Guide Other Resources LAUSD / Amplify Science 2022-2023 Scope and Sequence

LAUSD / Amplify Science microsite

Caregivers Site

Classroom Slides

Unit Guide Resources



https://bit.ly/3RsFCsy

Planning time (Be prepared to share what you have been planning)

- Suggestions
 - Prep your charts
 - Read your unit's key documents
 - Familiarize yourself with the digital tools and sims
 - Familiarize yourself with the hands on activities
 - Preread the student texts
 - Download all the classroom slides for your unit and put in chapter folders
 - Review the differentiation in lessons and edit slides to meet the needs of your students.



Share Out

- Are you planning differently for the unit after our work today?
 - Have you made any additions to your planning?
 - Have you made any adjustments?









Assign feature

Teacher tip: Use the Assign feature to assign activities and due dates.

Students will be notified with a bell icon. This makes it easier for students to know what's assigned and what's due.



Classwork

Classwork is a feedback tool for all student work that is submitted digitally through the student platform.

Classwork allows you to track who has completed which assignments, score student work, and send digital feedback.

Classwork					PROG	RAMS & APPS	TEACHER
· 7th Grade Science	Period 2						\
			ACTIVITIES	PORTFOLI	os	GRO	UPS
UNIT	CHAPTER		LESSON		ACTIVITY	TYPE	
Metabolism	▼ 2 The Boo	ly System	▼ all	•	all		•
ACTIVITY			SUBMISSIONS	LAST SUBMISSION		FEEDBACK	i.
5. HOMEWORK Homework Lesson 2			20/22	10/13/20 Thurs. 12:21pm		22 awaiting	^
STUDENT	STATUS	MC	GENERAL COMMENT	CUSTOM SCORE	WORDS	COMMENTS	FEEDBACK
Anthony Bryk	Handed In 10/13/20 11:59am	3/6	I can tell you were thinking	В	99	3	
Mihaly Csikszentmihalyi	In Progress	-			0	0	-
Carol Dweck	Not Started	-	Please complete!		0	1	1
Jamie Escalante	Resubmitted 10/12/20 7:04pm	3/6	Try rereading the passage	B+	126	1	
Fatima al-Fihri	Handed In 10/13/20 11:40am	6/6	Wow! Great use of evidenc	A	54	1	
Herbert Ginsburg	Handed In 10/13/20 11:54am	4/6	Big improvement from last	В	96	2	
Eric Donald Hirsch	Handed In 10/13/20 11:37am	3/6	Next time, try to work on	B-	51	1	
Jovita Idár	Resubmitted 10/14/20 11:59am	6/6	You really wrote effectively	A+	134	1	/

Grade sync from Classwork to Schoology-Video Support

https://bit.ly/44YzfB8



ACTIVITY		SUBMISSIONS	LAST SUBMISSION \$	DUE DATE	FEEDBACK
1. INDIVIDUAL Selected Response Qu Lesson 1	lestions	20/22	9:34am ^{Wed. 3/1/21}	11:59pm Fri. 3/5/21	20 🔨
STUDENT	STATUS	мс	GENERAL COMMENT	сизтом sco	G FEEDBACK
Anthony Bryk	Handed In 3/5/21 9:31am	12/20		60/100	/
Mihaly Csikszentmihalyi	In Progress	-		0/100	/
Carol Dweck	Handed In 3/2/21 11:45am	16/20		80/100	/
Jamie Escalante	Handed In 3/5/21 2:32pm	20/20		100/100	/
	Handed In				
Michelle Obama	Handed In 3/3/21 9:35am	15/20		75/100	
Seymour Papert	Handed In 3/5/21 4:15am	16/20		80/100	/
Linda Roberts	Handed In 3/2/21 12:33am	16/20		80/100	
Dorothy Strickland	Handed In 3/2/21 10:15am	14/20		70/100	
Kenneth Keek Sync with LM	Handed In 3/3/21 9:20an S	12/20		60/100	
	t sync with LMS /21 8:20am	Reporting	Send all feedback		Mark Incorrect Reveal Correct
2. INDIVIDUAL					
Constructed Response	e	22/22	10:19am _{Tues.} 2/28/21	11:59pm Fri. 3/5/21	22 🗸

Grade sync from Classwork to Schoology-Video Support

LINDIVIDUAL					
Selected Response Qu Lesson 1	uestions	20/22	9:34am Wed. 3/1/21	11:59pm Fri. 3/5/21	20 🔨
STUDENT	STATUS	MC	GENERAL COMMENT	сиятом s	CORE FEEDBACK
Anthony Bryk	Handed In 3/5/21 9:31am	12/20		60/100	/
Mihaly Csikszentmihalyi	In Progress	-		0/100	1
Carol Dweck	Handed In 3/2/21 11:45am	16/20		80/100	/
Jamie Escalante	Handed In 3/5/21 2:32pm	20/20		100/100	/
	Handed In				A
Michelle Obama	Handed In 3/3/21 9:35am	15/20		75/100	
Seymour Papert	Handed In 3/5/21 4:15am	16/20		80/100	/
Linda Roberts	Handed In 3/2/21 12:33am	16/20		80/100	
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Kenneth K och Sync with LM	Handed In 3/3/21 9:20an IS	12/20		60/100	
	st sync with LMS 7/21 8:20am	Reporting	Send all feedback		Mark Incorrect Reveal Correct
2. INDIVIDUAL					
Constructed Respons	e	22/22	10:19am _{Tues. 2/28/21}	11:59pm Fri. 3/5/21	22 🗸



<u>LAUSD-Sync Grades to</u> <u>Schoology-Amplify</u> <u>Classwork Guidance</u>

http://bit.ly/3RgzLqu







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- ✓ Use the Amplify curriculum and resources to prepare to teach ₀



Teaching science

"Science [is] both a body of knowledge and an evidence-based, model and theory building enterprise that continually extends, refines, and revises knowledge."

Closing reflection

Based on our work today in Part 2, share:

Head: something you'll keep in mind

Heart: something you're feeling

Feet: something you're planning to do

LAUSD Micrositehttps://amplify.com/lausd-science



Welcome to Amplify Science!

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

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

Click the button below to preview the digital Teacher's Guide, and check back for exciting updates to this site!
Pg. 19

Additional resources and ongoing support

Customer Care

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



help@amplify.com







Please provide feedback!

Type:

Strengthen

Session title:

Unit one deep dive

Professional Learning Specialist name:

Insert name

(insert email, if you would like)