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

Amplify Science

Unit Internalization & Guided Planning

Deep-dive and strengthening workshop Grade 6, Traits and Reproduction

LAUSD 12/12/2020

Presented by Your Name

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

Use two windows for today's webinar

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		왕 ²¹ 🗏 _{You} 🖉 🚷	= AmplifyScience CALIFORNIA > Plate Motion > Chapter 1 > Lesson 1	1.2 QOW
Window #1			Lesson 1.2: Using Fossils to Understand	
	Miter Cary of Navigation Progr. x ■ Angelly Curriculum x ● PM.Resource_Coherence_Texet: x + + ← → C ■ apps.learning.amplify.com/curriculum/F/unit/8.311609506cdfts20152816648ac544_califormaintegrated.201	- 0 × 9-2020#progress-build 🕶 🖈 🖪 🛡 🕼 :	Earth	
	AmplifyScience Coursess > Plate Motion	•		2
	OPEN PRINTABLE PROGRESS BUILD	Flextension Compilation		
	Progress Build Level 1: The Earth's entire outer layer (below the water and soil that we see) is made solid rock that is divided into plates. Earth's plates can mow. Underneath the soil, vegetation, and water that we see on the surface of Earth is the outer layer of Earth is geosphere. It is solid part of our nock planet. This outer layer of Earth is covered entirely with hurd, solid rock that is divided miss eactions called planets. And, there planets can more.	The stigation Notebook NGSS Information for Parents and Guardians Print Materials (11" x 17") Down Materials (15" > 11")	24	
	Progress Build Level 2: The plates move on top of a soft, solid layer of rock called the mantle. At plate boundaries where the plates are moving away from each other, rock rises from the mantle and hardens, adding new solid rock to the edges of the plates. At plate boundaries where	Offline Preparation	Lesson Brief (4 Activities) < 1 WARM-UP Warm-Up TEACHER Why Geologists Value Fossils	e 2 TEACHER-LED Discussion Introducing Mesos
	plates are moving toward each other, one plate moves underneath the other and sinks into the mantle. Underneath the solv segratation, and water that we see on the surface of Earth is the outer layer of Earth's geosphere. the solid part of our rocky	Teaching without reliable classroom internet? Prepare unit and lesson materials for offline access.		GENERATE PRINTABLE LESSO
	Getting Ready to Teach ~	Offline Guide		
	Español Materials and Preparation ~		Lesson Brief	Digital Resources
			Overview ~	📡 All Projections
			Materials & Preparation ~	Completed Scientific
			Differentiation ~	📅 Video: Meet a Pa
			Español rds ~	The Ancient Mesosaurus

Norms: Establishing a Culture of Learners



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



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



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



Make sure you have a note-catcher present



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

Workshop goals

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

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



Plan for the day

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

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Instructional Materials



Middle school course curriculum structure

Geology on Mars

· Engineering Internship:

Rock Transformations

Engineering Internship:

Chemical Reactions

Populations and Resources

Phase Change

Matter and Energy

in Ecosystems

Grade 7

Launch:

Plate Motion

Plate Motion

Phase Change

Integrated model*

Grade 6

 Launch: Microbiome

Metabolism

- Engineering Internship: Metabolism
- Traits and Reproduction
- Thermal Energy
- Ocean, Atmosphere, and Climate
- Weather Patterns
- Earth's Changing Climate
- Engineering Internship: Earth's Changing Climate

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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

Launch units

- First unit
- 11 lessons

Core units

- Majority of units
- 19 lessons

Engineering Internships

- Two per year
- 10 lessons

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Standard Amplify Science Curriculum



■ AmplifyScience CALIFORNIA > Traits and Reproduction



JUMP DOWN TO UNIT GUIDE

GENERATE PRINTABLE TEACHER'S UIDE

Standard Amplify Science Curriculum

The Traits and Reproduction unit has **19 lessons** across 4 chapters. Each lesson is written to be **45 minutes** long.



Chapter 1: Exploring Variation in Spider Silk



Chapter 2: Examining Spider Genes

4 Lessons



Chapter 3: Investigating Spider Inheritance

6 Lessons



Chapter 4: Explaining Variation in Running Ability

4 Lessons

5 Lessons

Standard Amplify Science Curriculum

On the standard Amplify Science platform you will find all of your key documents for planning for the unit.

We will be using many of these in today's workshop.

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	~	Information for Parents an 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	~	

Standard Amplify Science Curriculum

On the standard Amplify Science platform you will find key lesson level information.

We will be navigating to lessons during today's workshop in order to better plan for collecting evidence of student learning in order to plan to meet the needs of diverse learners.



Amplify Science @Home Curriculum



Amplify Science @Home Curriculum

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



AmplifyScience@Home

Two different options:

@Home Units

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

@Home Videos

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





@Home Units

A shift in approach to respond to user feedback

Original approach: two different resources



Print-based: @Home packets

Digital: @Home slides and student sheets

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

Traite and Re-

@Home Lessor

Today, we will beg and Reproduction

> **Digital:** Google Slides @Home Slides and Google Doc student sheets 16

Updated approach: one resource, two formats



Amplify Science @Home Curriculum

You have access to the Traits and Reproduction @Home Unit.

The Traits and Reproduction @Home Unit has **14 lessons**. Each lesson is written to be **30 minutes** long.



Amplify Science @Home Curriculum

You have access to the Traits and Reproduction @Home Videos.

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

Traits and Reproduction -@Home Unit @Home Videos Hands-on investigations videos @Home Videos Instructions > TAR Lesson 1.2 TAR Lesson 1.3 \Box TAR Lesson 1.4 [Z]Z TAR Lesson 1.5 Metabolism Chapter 1 Lesson 1.2 Activity 1 Z TAR Lesson 2.3 Metabolism Chapter 1 Lesson 1.2 Activity 2 Part A Amplify. Amplify PLAY ALL Metabolism Chapter 1 Lesson 1.2 Activity 2 Part B Metabolism Chapter 1 Lesson TAR Lesson 3.2 Z Amplify 1.2 7 videos · 1.074 views · Last updated on Aug 6, 2020 Metabolism Chapter 1 Lesson 1.2 Activity 2 Part C G Unlisted Amplify TAR Lesson 3.6 [7] =. % A ... Metabolism Chapter 1 Lesson 1.2 Activity 3 Amplify SUBSCRIBE Amplify 2-44 Z TAR Lesson 4.3 Metabolism Chapter 1 Lesson 1.2 Activity 4 Part A Amplify 3:36 Metabolism Chapter 1 Lesson 1.2 Activity 4 Part B Amplify









Plan for the day

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

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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 v	Investigation Notebook
	Science Background ~	 Baseline Comparison 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 v	Teaching without reliable classroom internet? Prepare unit and lesson
	3-D Statements v	materials for offline access.
	Assessment System v	Offline Guide
	Embedded Formative Assessments ~	
	Articles in This Unit v	
	Apps in This Unit v	
	Flextensions in This Unit v	

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.

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
Betting Ready Triteach	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 NGSS Standards (Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts), Common Core State Standards for Eng 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) standards 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
Articles 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 6-8)
Flextensions in This Unit	Summarizes information about the Hands-On Flextension lesson(s) in the unit
Printable resources	
Coherence Flowcharts	Visual representation of the storyline of the unit
Copymaster Compilation	Compilation of all copymasters for the teacher to print and copy throughout the unit
Flextension Compilation	Compilation of all copymasters for Hands-on Flextension lessons throughout the unit
Investigation Notebook	Digital version of the Investigation Notebook, for copying and projecting
Multi-Language Glossary	Unit vocabulary words in 10 languages
NGSS Information for Parents and Guardians	Information for parents about the NGSS and the shifts for teaching and learning
Print Materials (8.5" x 11")	Digital compilation of printed cards (i.e. vocabulary cards, student card sets) provided in the
Print Materials (11" x 17")	Digital compilation of printed Chapter Questions and Key Concepts provided 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	~	



Planning for the Unit



Unit Map

Why do Darwin's bark spider offspring have different silk flexibility traits even though they have the same parents?

Scientists and engineers are investigating possible ways spider stills can be used for medical purposes, such as for artificial tendore. Student geneticsits to investigate what causes variation in spider site it rats. Specifically, they explain why parent spiders have offspring with widely varied site flexibility traits. They uncover the roles of proteiner and genes and the way that genes are inherited.

Chapter 1: Why do traits for silk flexibility vary within this family of Darwin's bark spiders?

Students figure out: The spiders in this family must have different proteins for silk flexibility in their cells. Variation in traits can be caused by variation in protein molecules: within individuals' cells. Potein molecules' structures after function and the way they connect to other molecules. Spider silk is made of proteins, and connections between these molecules affect the silk flexibility.

How they figure it out: Students explore traits and proteins in the Sim and test the effect of charging protein molecules. They are all host articles about different kinds of spiders and how ther silk traits are related to the protein molecules that make up the silk. They build physical models of connected protein molecules to make silk with different levels of ficulatify.

Chapter 2: Why do Darwin's bark spiders make different proteins for silk flexibility?

Students figure out; Genes are instructions for proteins: each gene version provides an instruction to make a specific protein molecule; An organism has ten ocopies of a gene of each feature; these can be the same version (homosgous) or different (heterosgous). The spiders in the family have different gene versions of silk flexibility; some are homosgous and some are heterosgous).

How they figure it out: Students read about the genes and proteins molved in hemophila. They use the Sim to investigate genes and their outcomes by making changes to genes and observing the effect on proteins and traits. They engage in a physical model that highlights genes as instructions and introduces mutations. They create visual models showing their explanations for how the spider offsping have different traits.

Chapter 3: Why do the Darwin's bark spider offspring have different gene combinations even though they have the same parents?

Students figure out in sexual reproduction, each parent randomir passes on one of its two copies of each gene to its offspring. Each offspring receives two copies of each gene, one from each parent. Each offspring can inherit a different combination of gene versions, so ablinging can have different traits from each other and from their parents. This random recombination of genes accounts for the variation in silk flexibility among the spiter offspring. Each gene version present in the offspring is ablor sersent in the parents, meaning on mutations took place.

How they figure it out: They read about identical and fratematives to learn how genes are passed on in sexual reproduction. They investigate how genes are passed on when spokers in the Sim reproduce. The distribution of the sime produce and least the effects of random mutations during reproduction. They model their understanding of how genes were passed on in the Darwin's bark spoke family.

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Pages 2-3

Reproduction

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Progress Build

Planning for the Unit		Printable Resources
Unit Overview	~	Article Compilation
Unit-Map	~	Coherence Flowchart
Progress Build		
Getting Ready to Teach	Ŷ	E Flextension Compilation
Materials and Preparation	~	Investigation Notebook
Science Background	~	INGSS Information for Parents and Guardians
Standards at a Glance	~	Print Materials (8.5" x 11")
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Assessment System	~	Offline Guide
Embedded Formative Assessments	×	
Articles in This Unit	~	
Apps in This Unit	~	
Flextensions in This Unit	~	



Planning for the Unit

Progress Build

Progress Build

Each Amplify Seince Middle School until a structured around a unit-specific learning progression, which we call the Progress Built. The unit's Progress Built discribus the way uturent's replanatory 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 student's learning in organizes the sequence of instruction (organized), such and the Progress Built corresponds to a chapter), defines the focus of assessments, and grounds the inferences about student learning progress that gids asgueted instructions adjustments and differentiation. By aligning instruction and assessment to the Progress Built (and therefore to each offer), 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 Traits and Reproduction Progress Build consists of three levels of science understanding. To support a growth model for studied largering progress, each level encompasses and of the ideas of privelse and represents an explanatory succurit of unit phenomena, with the sophistication of that account increasing as the levels increase. As each level, students and new ideas and integrate them into a progressively idease understanding of the traits and Since the Progress Build reflects an increasingly complex yet integrated explanation, we represent it by including the me videas for each level in bold.

Prior howering (preconceptions). At the start of the Tarits and Reproduction unit, middle school students are likely to understand that arosimes in the same species can have wraying body characteristics, such as different faither or fur colors, and that this variation can accur even between parents and offspring and among subling within the same family. However, they will most likely be largely understanding of parents interface. Mary students are likely to have a simplified conception that equates genes within tarks. Students may also recognize genes in motify in connection with DNA tarting theyweer, students are unlikely to indicated with a genes is, where genes are located in the body, or any specifics about Tow genes influence traits. Without these concepts, they may not be convinced by solerific any specifics about Tow genes influence traits. Without these concepts, they may not be convinced by solerific of the phonemess. This issues in theorems even more important to keeping level and wisualizations to allow students to develop their understanding. This experiments and prior involvedge can be built on and refined, which the Tarks and Reproduction Progress built are unit affectuare as exigended to be

Progress Build Level 1: The traits of an organism are determined by the structure of protein molecules and the interactions of those protein molecules in cells.

The traits that an organism has depend on the proteins in its cells and how those proteins function. The function of a protein molecule depends on its structure and how it interacts with other protein molecules. Differences in the structure of protein molecules affect how they connect to other protein molecules. which can are ult in different traits.

Progress Build Level 2: Genes are instructions for producing proteins.

The traits that an organism has depend on the probins in its cells and how those problem function. The function of a problem indexicule depends on this structure and how it interacts with other problem indexicule discuss. Differences in the structure of problem molecules affect how they connect to other problem molecules. Which can result in different traits. Genes are instructions for problems, and each gene version provides a unique instruction to make a specific problem molecule and an organismiz cells. An organism has been cooples of a gene for each heature can be same version (homozygous) and provide instructions for only one type of problem or eacies in versions (homozygous) and provide instructions for only goes of problem.

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Pages 4-5

raits and Reproduction

combination of gene versions

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can result in different traits.

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sch gene to its offspring. The

ferent traits from each other

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Planning for the Unit

Unit Internalization Work Time

Page 6			a gen protei
What science ideas do students need to figure out in order to explain the phenome	non?		protei struct Progr The tr protei struct Gener protei
		2	Progr Inters The t
		How they figure it out: They read about identical and fratemal twins a reproduction. They investigate how genes are passed on when spider random multitom during reproduction. They model their understand bark spider family.	How to ha with any : expla of th stud
By the end of the unit, students figure out		nave time same parents? Students figure out: In sexual reproduction, each parent randomly pu offspring. Each offspring receives two copies of each geme, one from e combination of gene accounts for the variation in slift exolity parent recombination of genes accounts for the variation in slift exolity parent present in the offspring is also present in the parents, meaning no mu	each Since new i Prior unde color
		engage in a physical model that highlights genes as instructions and i showing their explanations for how the spider offspring have different Chapter 3: Why do the Darwin's bark spider offspring have diff	devel The 7 mode expla
Unit Question:	Student role:	How they figure it out: Students read about the genes and proteins in investigate genes and their outcomes by making channes to senes an	the Pr stude and a
		Students figure out: Genes are instructions for proteins: each gene v protein molecule. An organism has two copies of a gene for each featu or different (hterroxygoue). The spiders in the family have different ge homozones and same are heteroxygoues.	Each Progr phen strue
		levels of flexibility. Chapter 2: Why do Darwin's bark spiders make different prote	Pro
the set present of statements are intestigating in your anits		How they figure it out: Students explore traits and proteins in the Sin molecules. They read short articles about different kinds of spiders an molecules that make up the silk. They build physical models of connet	Pla
What is the phenomenon students are investigating in your unit?		Students figure out: The spiders in this family must have different prote traits can be caused by variation in protein molecules within individual* ² a function and the way they connect to other molecules. Spider slik is m molecules affect the silk flexibility.	is for silk flex ells. Protein n Tra
one due.		Chapter 1: Why do traits for silk flexibility vary within this family	of Darwin's t
		artificial tendons. Students act as student geneticists to investigate what Specifically, they explain why parent spiders have offspring with widely va roles of proteins and eenes and the way that eenes are inherited.	causes variati ried silk flexib
Part 1: Unit-level internalization		they have the same parents?	SIR READ
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xibility traits even though	I Reproduction		
medical purposes, such as for riation in solder silk traits			
exibility tra			
r's bark si Progress Build		Traits and Plann	d Reproduction hing for the Unit
Traits and Reproduction Planning for the Unit		Progress Build	tion of a
Progress Build			he ent traits. rotein gene for different
Each Amplify Science Middle School unit is st Progress Build. The unit's Progress Build desc	ructured around a unit-specific learning progr ribes the way students' explanatory understa	ession, which we call the inding of the unit's focal	pring. The ferent

Pages 2-5

Program Built. The unit's Programs Build denoties the way subservice registratory understanding of the unit's food phonomens is likely to design and design on other occurs of a unit. If an important tool in understanding the distribution of a unit and in supporting subservice is a support on the subservice of a support of the unit strateging the design of the support of the

The Task and Reproduction Programs Build consists of threse levels of science understanding. To support a growth model for studied testing propersus, such level encomparisons all of tubies of prior levels and encrements an explanatory accurit of unit phenomena, with the supplication of that accourt increasing as the levels increase. All accelentiation and accelent testing and accelent the micro as organized department and accelent testing of why task accelent Science and accelent accelentiation of that accourt increasing as the levels increase. All sciences accelent accelentiations are accelent to accelent testing of why task accelent Science Testing accelentiation and accelentiation accelentiation accelentiation and sciences and accelentiation a

Prior knowledge (prescenge)tions). All the dart of the Tabla and Reproduction with initialise school students are likely to understanding that operations in the same species days characteristics, such as different Nathar for all colors, and that this variation can accure were believen parents and offspring and among sublings within the same family. However, they all most likely to largely variantized with the mechanism of granic likely relation. Were subtional that this variation can accure were believen parents and offspring and among sublings within the same family. In the same family, the same family is under a start likely constrained with a same family. In the same family, the same family to understand with a same is known grane as most likely is normalised with a any specifical solution agrins. Similariase traits. Situations have also exceeding, they range rate is write granes are started in the body of any specifical solution agrees. Similariase traits. Situations have also exceeding they range is known granes are started in the body or any specifical solution bargeness and that multi-bard solutions and they also exceeding they accure started as underlined and they be construct. This means is theorems are more instruction for a body more started solution the started students to develop their understarted. These parenterists are for for incredeling and built on and refired, which the Tablase and Reyardoxidants for the structure are exceeding to do.

Progress Build Level 1: The traits of an organism are determined by the structure of protein molecules and the interactions of those protein molecules in cells.

The braits that an organism has depend on the proteins in its cells and how those protein sfunction. The function of a protein molecule depends on its structure and how it interacts with other protein molecules. Differences in the structure of protein molecules afted how they comnect to other protein molecules, which can result in different traits.

Progress Build Level 2: Genes are instructions for producing proteins.

Unit Map

Traits and Reproduction

Planning for the Unit

The task that an organism has depend on the profess in the cells and have those proteins function. The function of a protein molecule depends on its structure and those it interacts with those proteins induced. Differences in the structure of proteins molecules and those they connect to other proteins molecules. Unlike that are used in differences and the proteins, and eadly one wavelow produce a straight instructions to make a specific difference of the structure of the agains for each feature can be that some variant (homes types) and provide instructions for only can be protein earlies of each feature can be that can be provided instructions for the types of proteins.

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Unit Guide Document	Guided Unit Internalization Part 1: Unit-level internalization Unit title: Traits and Reproduction	Page
Unit Map	What is the phenomenon students are investigating in your unit? Darwin's bark spider offspring have widely varied even though they have the same parents.	silk flexibility traits, 🛛
Lesson Overview Compilation	Unit Question: VVhy do traits vary, and why do they vary even between parents and offspring and among siblings?	student role: Student geneticists
Unit Map	By the end of the unit, students figure out The spider offspring have different proteins for silk flexibility in inherited different sets of genes (which are instructions for pro Each offspring receives two copies of each gene, one from each have different combinations of gene versions, so they get differ proteins. This led to varied traits in the sibling spiders.	n their cells, because they oteins) from their parents. parent. Sibling spiders can rent instructions for silk
Progress Buld	What science ideas do students need to figure out in order to explain the phenomenor. The traits of an organism are determined by the struct the interactions of those protein molecules in cells. Gen producing proteins. Through sexual reproduction, an org combination of gene versions from its parents.	cture of protein molecules and nes are instructions for ganism inherits a random









Plan for the day

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

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Traits and Reproduction

Planning for the Unit



Unit Map

Why do Darwin's bark spider offspring have different silk flexibility traits even though they have the same parents?

Scientists and engineers are investigating possible ways spider silk can be used for medical purposes, such as for artificial tendons. Students act as student geneticists to investigate what causes variation in spider silk traits. Specifically, they explain why parent spiders have offspring with widely varied silk flexibility traits. They uncover the roles of proteins and genes and the way that genes are inherited.

Chapter 1: Why do traits for silk flexibility vary within this family of Darwin's bark spiders?

Students figure out: The spiders in this family must have different proteins for silk flexibility in their cells. Variation in traits can be caused by variation in protein molecules within individuals' cells. Protein molecules' structures affect their function and the way they connect to other molecules. Spider silk is made of proteins, and connections between these molecules affect the silk flexibility.

How they figure it out: Students explore traits and proteins in the Sim and test the effect of changing protein molecules. They read short articles about different kinds of spiders and how their silk traits are related to the protein molecules that make up the silk. They build physical models of connected protein molecules to make silk with different levels of flexibility.

Chapter 1: Exploring Variation in Spider Silk

JUMP DOWN TO CHAPTER OVERVIEW



@Home Unit Lesson Index

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

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

Amplify Science

Traits and Reproduction @Home Lesson Index

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

Index: @Home Unit Lessons and corresponding Traits and Reproduction Lessons

		l or modified versions of the unit's		Adapted from Amplify Science Traits and Reproduction	@Home Lesson
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Traits and Reproduction @Home

Key Activities

- Introducing Spider Silk Research: Students are introduced to the unit problem and their role as student researchers.
- Talk: Students are introduced to the Darwin's Bark spider family tree and discuss with a partner their observations about the differences in silk flexibility traits among the spider family.
- Observe: Students are introduced to the *Traits and Reproduction* Simulation and make observations of spiders.

Ideas for synchronous or in-person instruction

Before meeting, have students watch the introductory video and read the message from Bay Medical Company. While meeting, introduce the spider family and the vocabulary words *feature* and *trait*. Have students share their initial ideas about the Chapter 1 Question. You can either have students complete the Sim investigation individually, then share observations as a class, or have students observe and record their observations as you show the Sim. If you are meeting in person with students who don't have digital access at home, take the opportunity to have them complete the Sim investigation in class (as in *Traits and Reproduction*, Lesson 1.2, Activity 3).

Traits and Reproduction **Output Output Output Outp**

AmplifyScience

Today, we will begin a new unit called *Traits and Reproduction*.

People may say you have your mother's eyes or that you look like your sister. Even though you may have some **traits** in common, you are also very different, even from your relatives.

In this unit, we'll learn what determines an organism's traits and **why organisms can be similar or different** within a family.

In the Traits and Reproduction unit we will be thinking about this question:

Unit Question

Why do traits vary, and why do they vary even between parents and offspring and among siblings?



You will now watch a video about a scientist who is researching **traits in spiders.** She is interested in the different kinds of spider silk. We will focus on these traits throughout the unit.

Note: all videos in this @Home Unit can be viewed on a smartphone, or any other connected device.
As you watch the video, think about this question.

Why are scientists interested in spider silk?



Using the print version? Watch the video here: tinyurl.com/AMPTR-01

In this unit, we will do work that is like the scientists in the video. You will take on the role of **student genetic researchers** at Bay Medical Company, researching spider silk in Darwin's bark spiders.

Next, you will read a memo that describes what you will be investigating about spiders.

To: Student Researchers From: Dr. Ada Sattari, Lead Scientist at Bay Medical Company Subject: Spider Silk Research



I lead the Spider Silk Research Team, a group of genetic researchers. We are working on medical treatments that use silk from the Darwin's bark spider, a newly discovered spider species. These spiders produce very strong silk. We want to see if their silk can be used to make tendons and stitches for humans. For this to work, the silk must be both strong and flexible. A medium level of flexibility is optimum.

Unfortunately, we have discovered that not all Darwin's bark spiders are the same. Some spiders, even those in the same family, make more flexible silk than others. As student researchers, you will work to explain why traits such as silk flexibility can vary within a family of Darwin's bark spiders. Darwin's bark spiders are a real, recently discovered species.

Dr. Sattari and Bay Medical Research are not real but our work in this unit will be similar to the research actual scientists are doing with spider silk.

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In this lesson and many others in the *Traits and Reproduction* @Home unit you will need to **talk with a partner.** Check with your teacher about how you will work with partners in this @Home Unit.

Darwin's Bark Spider Family Tree



This is the spider family you will be investigating. Observe the spider family and discuss this question with a partner.

What do you notice about the differences in **silk flexibility** traits among the spider family?

You probably noticed that the spiders have different **traits** for silk flexibility even though they are in the same family. In this unit, you will investigate why.

One feature you will be investigating is silk flexibility.



a characteristic that all members of a species have

High and low silk flexibility are examples of traits.



a specific characteristic of an individual organism

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

	Traits and Reproduction Glossary	
allele:	a specific form of a gene that provides instructions for making a particular molecule	
alelo: u una mo	na forma especifica de un gen que proporciona instrucciones para hacer Jécula de proteína particular	
chromos cromos	come: a long piece of DNA that contains many genes noma: un pedazo largo de ADN que contiene muchos genes	-
claim: afirmad	a proposed answer to a question about the natural world sión: una respuesta propuesta a una pregunta sobre el mundo natural	
DNA: a ADN: ui	type of molecule that genes and chromosomes are made of n tipo de molécula de la que están hechos los genes y los cromosomas	
eviden (refute)	ce: information about the natural world that is used to support or go against a claim	
evideno (refutar	ria: información sobre el mundo natural que se utiliza para respaldar o rechazar) una afirmación	e
feature atributo	: a characteristic that all members of a species have or una característica que tienen todos los individuos de una especie	brque
fertiliza fertiliza se com	ation: when a male and a female reproductive cell combine to create an offspring ción: cuando una célula reproductiva masculina y una célula reproductiva femenina binan para crear descendencia	
functio función	n: how something works : como trabaja algo	isms
gene: a gen: un	in instruction for making a protein molecule a instrucción para formar una molécula de proteína	
gene v protein	ersion: a specific form of a gene that provides instructions for making a particular molecule	
versión una mo	de gen: una forma específica de un gen que proporciona instrucciones para hacer Jécula de proteína particular	nes
hetero: heteroc	zygous: having gene versions that are different igótico: que tiene versiones de genes que son diferentes	
homoz homoc	ygous: having gene versions that are the same gótico: que tiene versiones de genes que son iguales	ring
	Traits and Reproduction @Home Lesson 1 #2221 Statement if is used if a difference of the second	
	rasgo: una característica específica de un organismo individual	
	variation: any difference in traits between individual organisms variación: cualquier diferencia de rasgos entre organismos individuales	
	Traits and Reproduction @Home Lesson 1 9 2007 The Reprod the Lawrence of the Lawrence of California (44 spin resource).	

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



Eye color is a **feature**.

People have different **traits** for eye color.

For example, they could have blue, brown, or green eyes.



Body color is an example of a **feature** in this species of spider.

Yellow and brown body colors are different **traits** of this species of spider. Silk flexibility is also a **feature**. All of the Darwin's bark spiders have this feature, but some spiders make silk that is more flexible than other spiders' silk.

High, medium, and low silk flexibility are different **traits** for the silk flexibility feature.

Think about this question.

What are some **traits** you have that are different from your friends and family members?

To start the unit, we will investigate this Chapter Question.

Chapter 1 Question

Why do traits for silk flexibility vary within this family of Darwin's bark spiders?

Darwin's Bark Spider Family Tree



Think about your initial ideas about the Chapter 1 Question.



Why do traits for silk flexibility vary within this family of Darwin's bark spiders?

Darwin's Bark Spider Claims

Question: Why do traits for silk flexibility vary within this family of Darwin's bark spiders?

Claim 1: The offspring have mutations that affect their traits.

Claim 2: The offspring's traits depend on which parent the offspring received more traits from.

Claim 3: The offspring received different combinations of traits from their parents. These are **claims** about why the trait for silk flexibility varies within the spider family.

We'll return to these claims as we learn more about traits in this unit.

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Throughout this unit, we will be using the *Traits and Reproduction* **Simulation** to help us learn more about **variation in the traits** of spiders.

Next, you will watch a video about how to use the Sim.

Under the spider you will see a group of cells.



Using the print version? Watch the video here: <u>tinyurl.com/AMPTR-022</u>



Next, you will make observations of spiders from the Sim. You will record similarities and differences in their **traits**.

Traits and Reproduction @Home Lesson 1

	Date:	
	Observing Spiders from the Sim	
Observe the image of :	spiders from the Sim and record your observations below.	
What similarities do yo	ou observe in the spiders' traits ?	
What differences do yo	You observe in the spiders' traits ?	
Are all spiders the sam	ne? Explain your answer.	

Go to the **Observing Spiders from the Sim** page.

Observe the image of spiders from the Sim on the next slide. **Record** similarities and differences in their traits.



You probably noticed that all of the spiders are not the same. Some were different colors, some had bigger or smaller bodies, some had more or less bristle (the hair on their bodies).

We know that humans can have different **traits**, but it can be more challenging to see these differences in other species, such as spiders.



Traits and Reproduction @Home Lesson 1

End of @Home Lesson





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Suggestions for Online Synchronous Time







Online synchronous time

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

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

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

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

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

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Reflection: Teaching @Home Lesson 1 How would you teach this lesson?





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

ay <u>@Home Lesson</u> 1				
Ainutes for science: <u>15 min</u>	•	Minutes for science:		
Asynchronous Synchronous		Instructional format: Asynchronous Synchronous		
Lesson or part of lesson: Introducing spider silk research (slides 1-10)		Lesson or part of lesson:		
Mode of instruction: Preview Review Teach full lesson live Students work independently using: Printed @Home Slides Digital @Home Slides @Home Videos		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		
tudents will View the video about spider silk research and read the letter from Bay Medical Company. Jot down initial deas about why the traits vary among	Teacher will assign slides 1-10 in Schoology and provide direction for students to jot down their ideas about the unit problem to share when the class	Students will	Teacher will	

0

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

Day@Home Lesson 1			
Minutes for science: <u>15 MlN.</u>		Minutes for science: <u>30 mln</u>	
Asynchronous Synchronous		Instructional format: Asynchronous Synchronous	
Lesson or part of lesson: Introducing spider silk research (slides 1-10) Mode of instruction: Preview Review Teach full lesson live Teach using synchronous suggestions Students work independently using: Printed @Home Slides Digital @Home Slides @Home Videos		Lesson or part of lesson: Talk and Observe activities (slides 11-32) Mode of instruction: Preview Review Teach full lesson live Teach using synchronous suggestions Students work independently using: Printed @Home Slides @ Wome Videos	
Students will View the video about spider silk research and read the letter from Bay Medical Company. Jot down initial ideas about why the traits vary among spiders in the same family.	Teacher will assign slides 1-10 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 Pause for pair discussion prompts on slides 12, 21, and 23. VVatch Sim model, and complete Student Sheet (slide 28). Practice logging in to find Amplify Library and Sim.	Teacher will Lead students through the lesson activities using slides 11-32, pausing for partner discussion. Model Sim and lead class discussion about spider traits. Show how to navigate to Library and Sim.

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Breakout groups

Discussion prompts

Planning:

• Share additional ideas for how you plan to lead Lesson 1

Student work:

• Discuss how you can collect evidence of student work

Differentiation:

• Consider how you might differentiate this lesson



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ook at the <i>Students will</i> columns. What are students working in the lesson(s)	Some Types of Written Work in Amplify Science Daily written reflections Homework tasks Investigation notebook pages Written explanations (typically at the end of Chapter) Diagrams Recording pages for Sim uses, investigations, etc 	
hat you could collect, review, or provide feedback on? ee Some Types of Written Work in Amplify Science to the right for guidance. f there isn't a work product listed above, do you want to add one? Make notes below.		
How will students submit this work product to you?	Completing Written Work	Submitting Written Work
tudents can complete and submit work.	 Plain paper and pencil (videos include prompts for setup) (6-8) Student platform Investigation Notebook Record video or audio file describing work/answering prompt Teacher-created digital format (Google Classroom, etc) 	 Take a picture with a smartphone and email or text to teacher Through teacher-created digital format During in-school time (hybrid model) or lunch/materials pick-up times (6-8) Hand-in button on student platform
vill you differentiate this lesson for diverse learners? (Navigate to the lesson level on t	he standard Amplify Science platform and c	lick on differentiation in the left menu.)
Planning Resource

pages 12-13

Day 2: Minutes for science: Instructional format: Asynchronous Synchronous		Minutes for science: Instructional format: Asynchronous Synchronous	Minutes for science:		ten reflections rk tasks ion notebook pages xplanations (typically at the end of Chapter) g pages for Sim uses, investigations, etc	
Lesson or part of lesson:		Lesson or part of lesson:	Lesson or part of lesson:		Submitting Written Work	
Mode of instruction: Preview Review Teach full lesson live Teach using synchronous suggestions Students work independently using: @Home Packet @Home Slides and @Home Student Sheets @Home Videos		Mode of instruction: Preview Review Teach full lesson live Students work independ @Home Packet @Home Slides and (@Home Videos	Mode of instruction: Preview Review Teach full lesson live Teach using synchronous suggestions Students work independently using: @Home Packet @Home Slides and @Home Student Sheets @Home Videos		 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 (6.2) Lead is butter and the state of the sta	
students will	Teacher Will	Students will	Teacher Will	, etc) Science platform and c	(0-6) Particlin Dutton of student platform	
					۵r	









Plan for the day

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

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During this workshop did we meet our objectives?

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

Upcoming LAUSD Office Hours

Monthly through January

• Thursday, 1/14 (3-4pm)





Program Hub: Self Study Resources



Back to school national webinar series



Topics included:

- Remote and hybrid learning support
- Navigation support
- What's new for 2020-2021
- Planning support
- Curriculum overview

bit.ly/BTSwebinars

Additional Amplify resources



Caregivers site

Provide your students' families information about Amplify Science and what students are learning **amplify.com/amplify-science-familyresource-intro/**

Additional Amplify resources



Program Guide

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

http://amplify.com/science/california/r eview

Amplify Help

Find lots of advice and answers from the Amplify team. **my.amplify.com/help**

Additional Amplify Support

Customer Care

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



scihelp@amplify.com



800-823-1969



When contacting the customer care team:

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

Please provide us feedback!

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

Presenter names:

Date: xx





