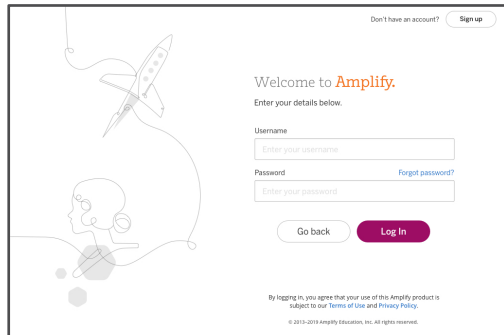
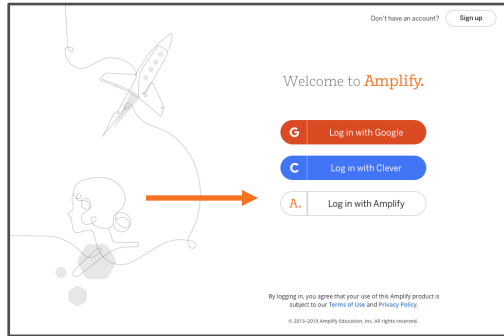


Welcome to Amplify Science!

Do now: Name tent and login



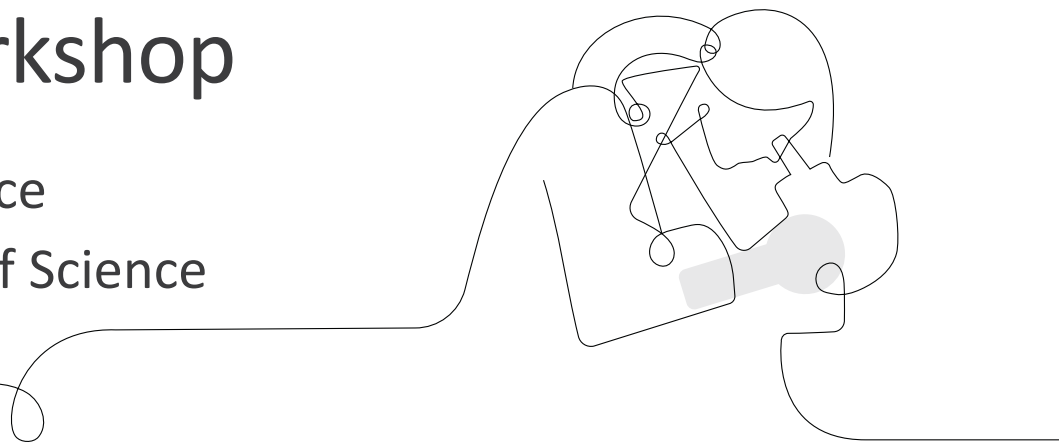
1. Make a name tent
2. Go to learning.amplify.com
3. Select **Log in with Amplify**
4. Enter teacher demo account credentials
 - XXXX@tryamplify.net
 - Password: AmplifyNumber1
5. Explore as we wait to begin

Amplify Science

Inheritance and Traits Implementation workshop

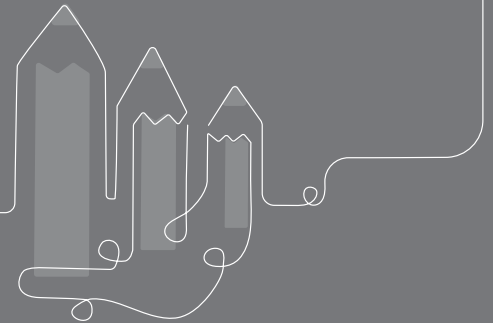
A professional learning experience
designed by the Lawrence Hall of Science


NYC DOE
November 5, 2019
Presented by Your Name



Workshop goal

- Prepare teachers to implement Inheritance and Traits in their classrooms






Inheritance and Traits

Plan for the day

- Framing and reflection
- Experiencing the unit
- The story of the unit
- Planning to teach
- Closing



Inheritance and Traits

Plan for the day

- Framing and reflection
- Experiencing the unit
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- Closing

Framing and reflection

The purpose of this part of the day is for you to:

- Share your experience implementing Amplify Science.
- Refresh your understanding of key program resources and Amplify's approach.
- Identify successes and areas of need in your classroom, which will frame your work throughout the day.

Reflection roles

- Facilitator: Asks questions to ensure that there is equity of voice
- Timekeeper: Keeps team on time/task
- Recorder: Captures the information on paper as each person is presenting
- Summarizer: Shares highlights and summaries to the larger group

Scenario 1

Ms. Lambertsen needs to refresh her content knowledge of her next unit. She has a few questions about the science content in the unit, and wants to be ready when her students ask questions, too.

To deepen her understanding of the science ideas in the unit, what resources would you recommend she use?

Scenario 2

Mr. Garcia wants to plan what data he can collect on his students during an upcoming lesson and how he can then use the data to inform instruction to best support his students. He's also looking for some strategies to support students in his classroom that need more challenge.

What can he look at in the Teacher's Guide to support his planning?

Scenario 3

To prepare to administer the End-of-Unit Assessment, Ms. Lucey wants to familiarize herself with how students with different levels of understanding might respond to the assessment. She's also looking for some insight into how to evaluate their responses.

Where can she look for information to support her preparation to administer the assessment?

Scenario 4

Mr. Moore needs to identify the standards in his upcoming unit for his principal. Specifically, his principal wants to know how students engage with the three dimensions of NGSS to figure out the unit phenomenon/problem.

Where would Mr. Moore find out the answer to his principal's question? How do students engage in three-dimensional learning in this unit?

Scenario 5

At back to school night, Mr. Patel is going to tell his students' families about the next unit his class will work with. He wants to describe how students develop ideas through Chapter 1.

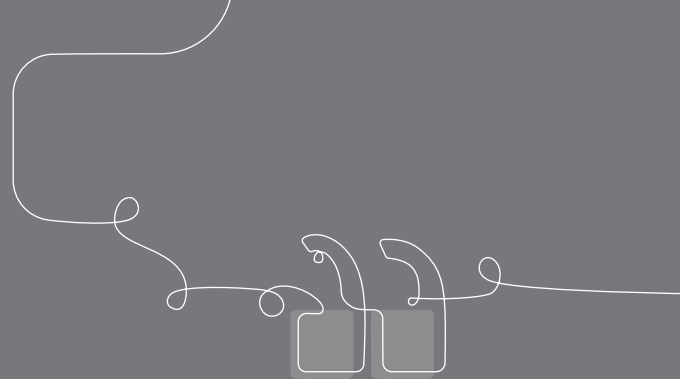
How do you think he could explain this to his students' families? Where might he look to find information that will help him plan what to say?


Scenario 6

Mrs. Doolittle is starting a new unit next week (the same one you are diving into today!). She's familiar with what students learn throughout the unit, but she's not sure where to start preparing to teach the first lesson.

What do you suggest she refer to as she prepares for her first lesson? What should she do or read first, and what should she do after that?

Questions?





Inheritance and Traits

Plan for the day

- Framing and reflection
- Experiencing the unit
- The story of the unit
- Planning to teach
- Closing

Experiencing the unit

The purpose of this part of the day is for you to:

- Understand how a phenomenon motivates student learning.
- Understand what students learn in a chapter of Inheritance and Traits, and how they learn it.
- Reflect on the instructional design in the Amplify Science program.
- Describe the content focus and coherence of the unit.

Elementary school course curriculum structure

Grade K

- Needs of Plants and Animals
- Pushes and Pulls
- Sunlight and Weather

Grade 1

- Animal and Plant Defenses
- Light and Sound
- Spinning Earth

Grade 2

- Plant and Animal Relationships
- Properties of Materials
- Changing Landforms

Grade 3

- Balancing Forces
- Inheritance and Traits
- Environments and Survival
- Weather and Climate

Grade 4

- Energy Conversions
- Vision and Light
- Earth's Features
- Waves, Energy, and Information

Grade 5

- Patterns of Earth and Sky
- Modeling Matter
- The Earth System
- Ecosystem Restoration

AmplifyScience

authored by






THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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Planning your year

Overview: Amplify Science K-5 course structure

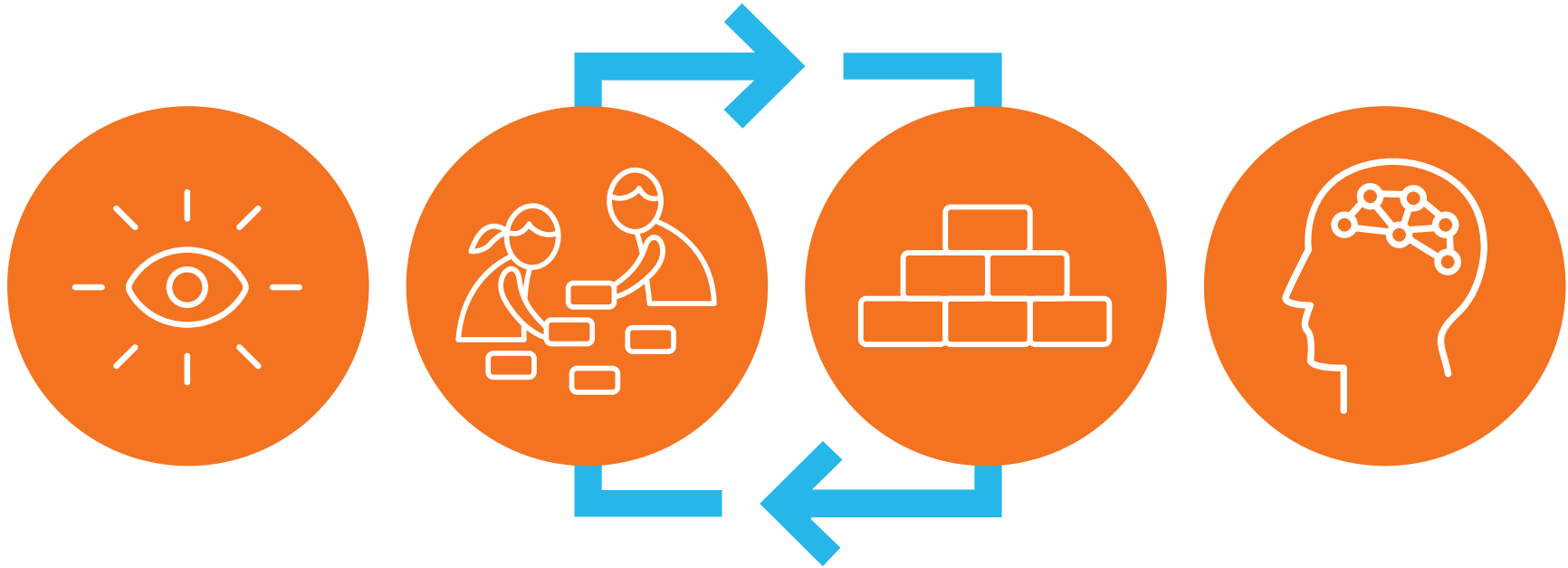
	 PRIMARILY LIFE SCIENCE			 PRIMARILY PHYSICAL SCIENCE			 PRIMARILY EARTH SCIENCE				
	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Minutes per lesson
K	Needs of Plants and Animals			Pushes and Pulls			Sunlight and Weather			45	
1	Animal and Plant Defenses			Light and Sound			Spinning Earth			45	
2	Plant and Animal Relationships			Properties of Materials			Changing Landforms			60	
3	Balancing Forces		Inheritance and Traits		Environments and Survival		Weather and Climate			60	
4	Energy Conversions		Vision and Light		Earth's Features		Waves, Energy and Information			60	
5	Patterns of Earth and Sky		Modeling Matter		The Earth System (26 lessons)			Ecosystem Restoration		60	

Problem-based deep dives

Students inhabit the role of scientists and engineers to explain or predict phenomena. They use what they figure out to solve real-world problems.



Amplify Science approach

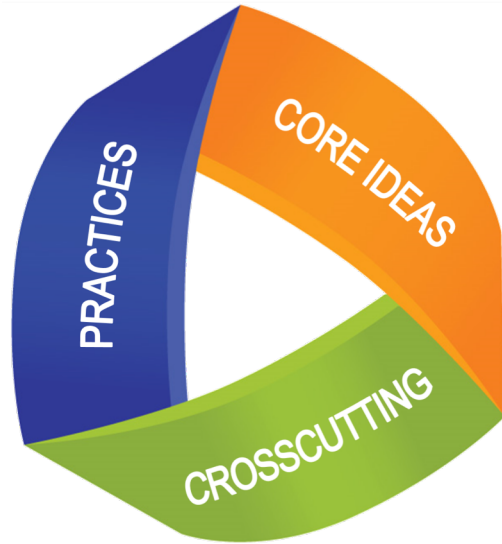


Introduce a phenomenon
and a related problem

Collect evidence from
multiple sources

Build increasingly
complex explanations

Apply knowledge
to a different context



Standards as three-dimensional performance expectations that integrate **disciplinary core ideas**, **science and engineering practices**, and **crosscutting concepts**

Unit level 3-D statement

Key

Practices

Disciplinary Core Ideas

Crosscutting Concepts

Unit Level

Students investigate the variation between similar organisms (patterns) and how traits that depict parents and offspring are determined (cause and effect).



Grade 3 | Inheritance and Traits

Instructional Sequence



We're about to begin a new science unit.

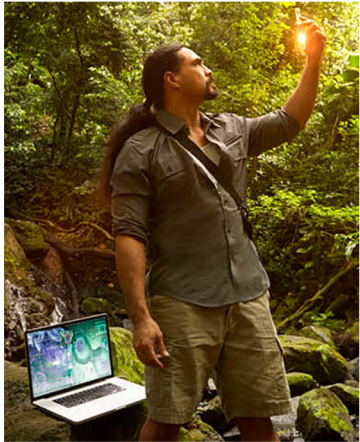
You will take on the role of **wildlife biologists**. You will investigate many of the things that scientists like wildlife biologists do.



Take a moment to look at these pictures of wildlife biologists.



What do you think **wildlife biologists** study?



Let's look at more pictures of wildlife biologists.



Where do you think **wildlife biologists** work?



As wildlife biologists, you will study **wolves** in Graystone National Park.

There is a mystery about one particular wolf that you will work to solve.



Wolves live in a **pack**, or group of many wolves.

Being part of a group often helps animals survive.

Unit Map

Inheritance and Traits

Planning for the Unit

Unit Map



Unit Map

What is the origin of the traits of Wolf 44—a wolf that appears to be different from the rest of its pack?

Students play the role of wildlife biologists working in Graystone National Park. They study two wolf packs and are challenged to figure out why Wolf 44, an adopted wolf, has certain traits. Students observe variation between and within different species, investigate inherited traits and those that result from the environment, and explain how Wolf 44 acquired certain traits.

Chapter 1: Why are wolves different from each other even though they are all the same species?

Students figure out: Even though all wolves are the same species, some wolves are different from others due to variation of traits within a species. This means that even though wolves can have similarities in their traits, there can also be variations in each trait. For example, wolves have different colors of fur: some wolves have a trait for gray fur, others have a trait for black fur.

How they figure it out: Students investigate similarities and differences between a broad array of organisms, including plants and animals. They focus on exploring patterns of similarities and differences of traits between animals, and finally narrow in on similarities and differences in organisms of the same species. By chapter's end, the class constructs an explanation about why wolves are different even though they are all the same species.

Chapter 2: Why is Wolf 44's color similar to one pack but different from the other?

Students figure out: Wolf 44's color is similar to the wolves in the Bison Valley Pack because its parents are in the Bison Valley Pack. Offspring inherit instructions for each trait from both parents. This means that the trait of fur color comes from Wolf 44's parents. This is why Wolf 44 has light-colored fur, similar to its parents.

How they figure it out: Students search for patterns in traits of parents and their offspring in wolf packs and fruit flies. They use a digital modeling tool to make sense of these relationships. They explore why offspring have similar traits to their parents, but not always to their siblings, as they read *The Code*. A lively classroom activity helps students apply the idea that parents pass instructions for traits. Students receive more information about the two wolf packs and then write a scientific explanation about Wolf 44's fur color.

Chapter 3: Why isn't Wolf 44 like the Bison Valley Pack in hunting style and size?

Students figure out: Wolf 44 doesn't hunt like the Bison Valley Pack because it learned to hunt from the wolves in the Elk Mountain Pack. Learning to hunt is a trait that is determined by a wolf's environment. Wolf 44 is medium sized because of inherited instructions and the environment it lives in. Its parents passed on instructions for being smaller in size, but Wolf 44 lives with the Elk Mountain Pack, which has access to a rich diet. This means that Wolf 44 can grow bigger than its parents, but it can't grow as big as the wolves in the Elk Mountain Pack.

How they figure it out: Students get new evidence, ask questions, and investigate with a digital app to figure out that some traits result from interaction with the environment, including learning and diet. Students write an explanation of Wolf 44's traits and whether they were inherited from its parents or acquired from the environment.

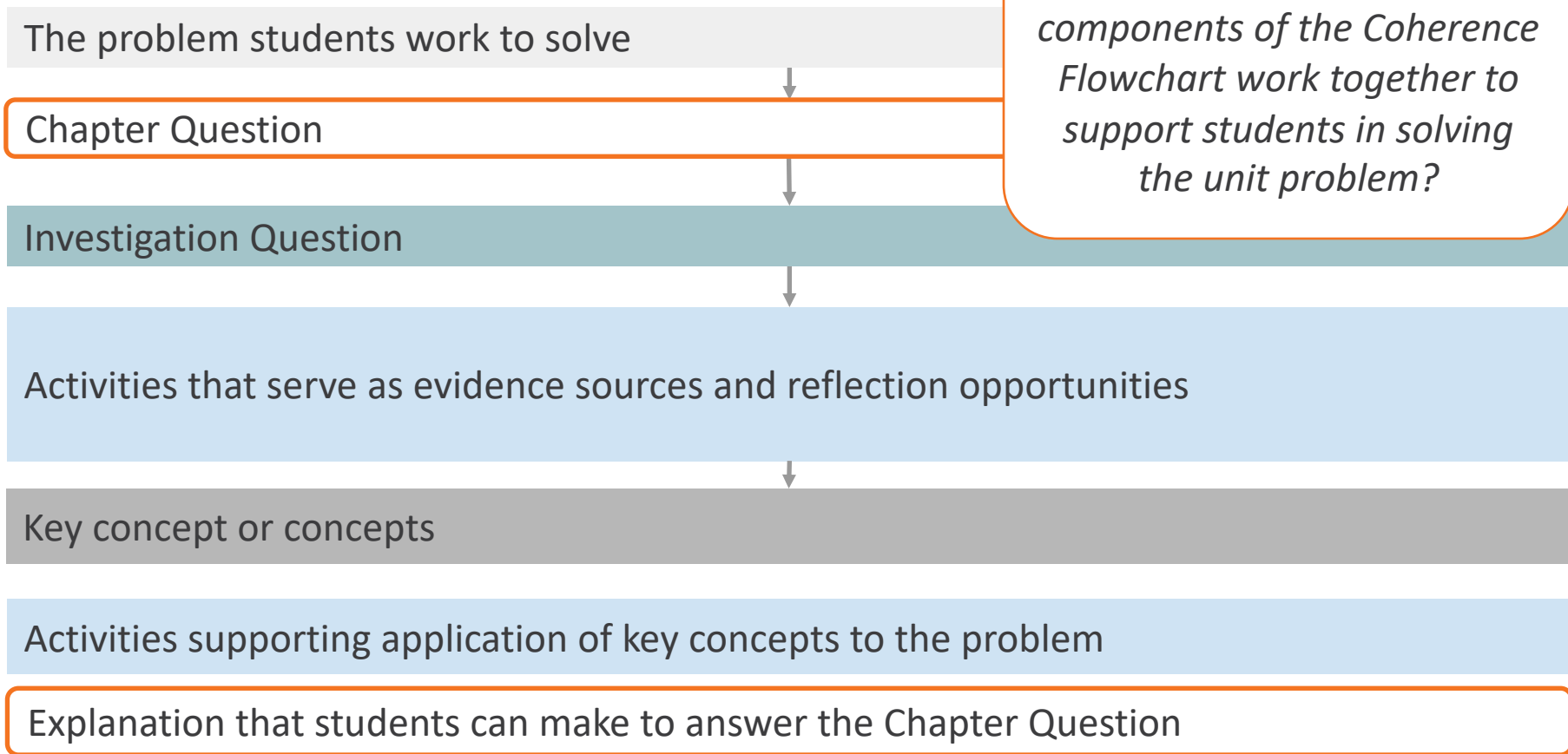
End-of-unit explanation

When light gets to a Tokay gecko's eyes, the gecko's light receptors respond and send information to the brain. The brain processes this information to form an image. Since the highway lights have been installed, there is more light at night when there is usually very little natural light. This is too much light for the kind of light receptors that the gecko has. This makes it difficult for the gecko's brain to form a clear image and for the gecko to see well.

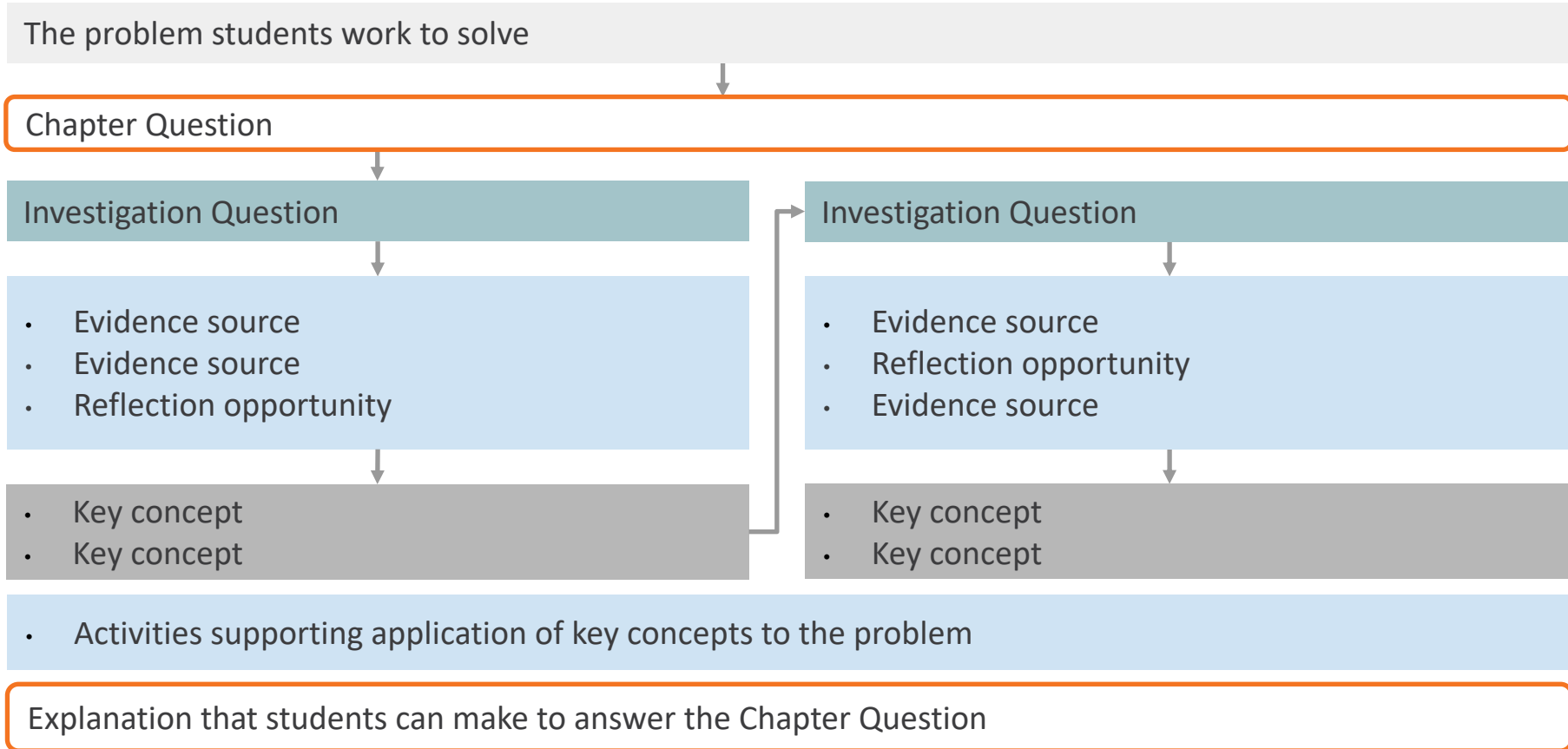
Coherence as a design principle

- Supports students in building a rich network of concepts
- Allows for increasingly complex explanations
- Supports students in integrating ideas
- Provides motivation to look more deeply at the phenomenon

Coherence Flowchart structure



Coherence Flowchart structure





Chapter 1: Why are wolves different even though they are all the same species?

☑ JUMP DOWN TO CHAPTER OVERVIEW

Lesson 1.1:

Pre-Unit Assessment

Lesson 1.2:

Blue Whales and
Buttercups

Lesson 1.3:

Observing
Similarities and
Differences

Lesson 1.4:

Introducing Species

Lesson 1.5:

Variation in a
Species

Lesson 1.6:

Making Sense of
Variation

Lesson 1.7:

Explaining Variation



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Graystone National Park

Elk Mountain Pack
Territory



Bison Valley Pack
Territory

Elk Mountain Pack



Elk Mountain Pack



Wolf 44 is part of the **Elk Mountain Wolf Pack**.

These posters show wolves in the pack and a map of Graystone National Park, where the pack lives and hunts.



We will be using the **Elk Mountain Pack Data Cards** to observe some of the wolves in the pack.

Vocabulary



data

observations or measurements recorded in an investigation

Name: _____ Date: _____

Similarities and Variations: Elk Mountain Pack

Directions:

1. Record the similarities and the variations you observe as you discuss the data about wolves.
2. Answer the question at the bottom of the page.

Similarities	Variations

What patterns do you notice?

Turn to page 12 in your notebooks.

You will **observe** the photos on the cards and use this page to record the **similarities** and **variations** you see.



Let's practice observing the wolves and looking for **patterns**.

One thing we can observe is that all these wolves have **pointy ears**.

Name: _____ Date: _____

Similarities and Variations: Elk Mountain Pack

Directions:

1. Record the similarities and the variations you observe as you discuss the data about wolves.
2. Answer the question at the bottom of the page.

Similarities	Variations
pointy ears	

What patterns do you notice?

Having pointy ears is a way all the wolves are similar.

We could **write *pointy ears* under *Similarities*.**

Name: _____ Date: _____

Similarities and Variations: Elk Mountain Pack

Directions:

1. Record the similarities and the variations you observe as you discuss the data about wolves.
2. Answer the question at the bottom of the page.

Similarities	Variations
pointy ears	thicker or thinner fur

What patterns do you notice?

One variation in the wolves is the thickness of their fur.

We could **write *thicker or thinner fur*** under ***Variations.***

Science questions

- How do the wolves in a pack look similar and different from one another?
- How far do wolf packs travel when they hunt?
- How are wolves able to hunt and kill animals that are bigger than they are?
- Why do some wolves have different fur colors?

Non-science questions

- Which wolf in this pack is the prettiest?
- Is it wrong for wolves to kill other animals?
- What is the best way to keep wolves from killing farm animals?
- Should we allow people to hunt wolves?



Chapter 1: Why are wolves different even though they are all the same species?

☑ JUMP DOWN TO CHAPTER OVERVIEW

Lesson 1.1:

Pre-Unit Assessment

Lesson 1.2:

Blue Whales and
Buttercups

Lesson 1.3:

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Remember that we are investigating this question:

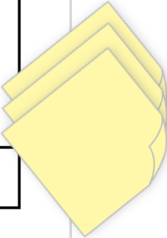
How can we describe the traits of organisms in a species?

Like other organisms, humans have traits that we can observe.



What are some **traits humans have** that you can observe?

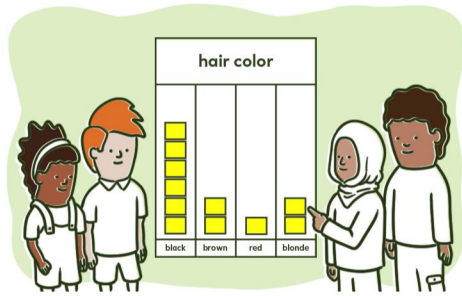
hair color			
black	brown	red	blonde



The **posters around the room** show different traits that humans have.

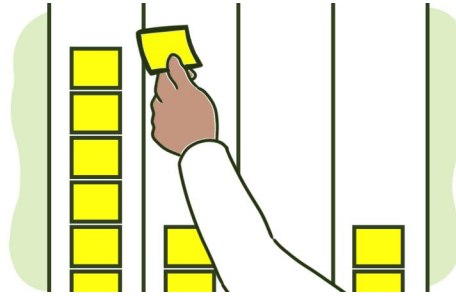
We will place sticky notes to show how many students have each trait.

Class Traits Poster Walk



Step 1

Visit a poster with your group. Decide which trait on the poster is the closest match to you.



Step 2

Place a sticky note above the trait that is your closest match. If there are already sticky notes, put your sticky note at the top.



Step 3

When you hear the signal, move with your group to the next poster.

Scientists use graphs to help them look for patterns.



What do you notice about the data shown on our class graphs?

Inheritance and Traits: Variation in Wolves

What is the origin of the traits of Wolf 44—a wolf that appears different from the rest of its pack?

Pg.
XX

Why are wolves different even though they are all the same species? (introduced in 1.4)

What are some ways that organisms can be similar or different? (1.1-1.4)

How can we describe the traits of organisms in a species? (1.5-1.6)

What are students figuring out?

- Read *Blue Whales and Butterflies* (1.1)
- Reflect on relatedness (1.2)
- Observe similarities and differences between organisms (1.3)
- Observe bird traits (1.3)
- Observe bird sounds (1.4)
- Observe bear traits (1.4)

- Look for patterns in the wolf pack (1.5)
- Construct bar graphs to analyze similarity and variation in students' traits (1.5)
- Read *Handbook of Traits* to gather info about how traits vary within a species (1.6)
- Use Word Relationships routine to reflect on learning across the chapter (1.6)
- Create digital models of trait variation (1.6)

Organisms have observable traits. (1.3)

Organisms in a species have many similar traits, but for each trait there can be variation. (1.6)

- Review wolf data and reflect on variation of traits within the wolf pack (1.7)
- Write class explanation about why wolves differ even though they are all the same species (1.7)

Even though all wolves are the same species, some wolves are different from others due to variation of traits within a species. This means that even though wolves can have similarities in their traits, there can also be variations in each trait. For example, wolves have different colors of fur: some wolves have a trait for gray fur, others have a trait for black fur.

The problem students work to solve

Chapter 1 Question

Investigation Questions

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to the problem

Explanation that students can make to answer the Chapter 1 Question



Chapter 1: Why are wolves different even though they are all the same species?

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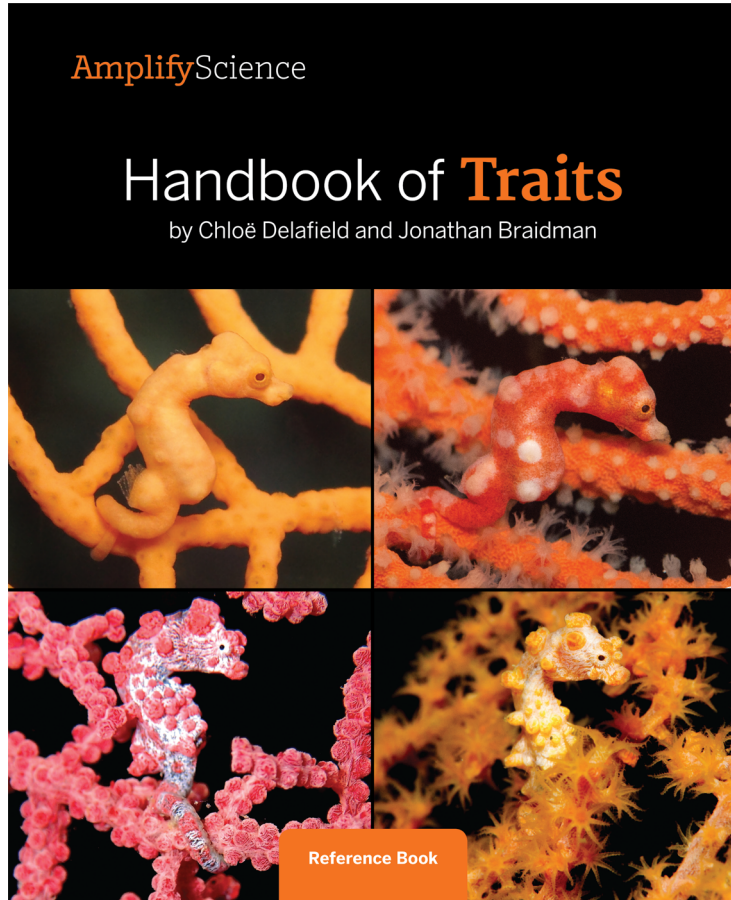
Variation in a Species

Lesson 1.6:

Making Sense of Variation

Lesson 1.7:

Explaining Variation



Many of you think that **traits vary within species** in organisms other than humans.

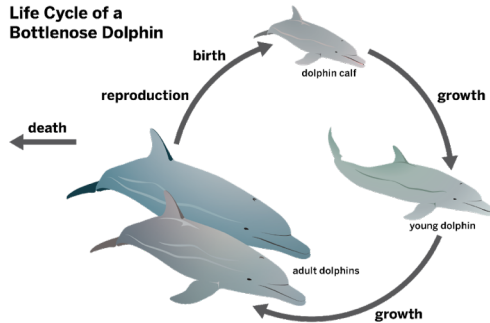
Let's read about other organisms to get more **evidence** for this idea.

Bottlenose Dolphin

Bottlenose dolphins live in the ocean all over the world. They have long bodies with two side fins and one top fin. They are gray in color. The biggest ones can be twice as long as a tall person. Even though they live in the water, dolphins breathe air. They have big brains and are very smart.



Life Cycle of a Bottlenose Dolphin



Variation in the Species

Bottlenose dolphins have **variation** in size and color. The dolphins in some groups are larger than the dolphins in other groups. Bottlenose dolphins also have different-sized beaks and fins. The **genes** that give instructions for these **traits** are passed from parents to **offspring**.

Another way that bottlenose dolphins vary is that each one has its own special whistle. Dolphins can tell each other apart by their whistles.



These dolphins show variation in color and beak size.

Name: _____ Date: _____

Evidence About Trait Variation

Directions:

1. Read about at least one plant and one animal in *Handbook of Traits*.
2. In the boxes below, record the name of a plant or an animal and list some of the traits that have variation.

Organism: **Bottlenose dolphin**Traits that have variation: **size, color, beak size, fin size, and whistle**

Organism:

Traits that have variation:

Organism:

Traits that have variation:

Organism:

Traits that have variation:

When I **read the page about variation**, I see that dolphins can vary in size, color, beak size, fin size, and whistles.

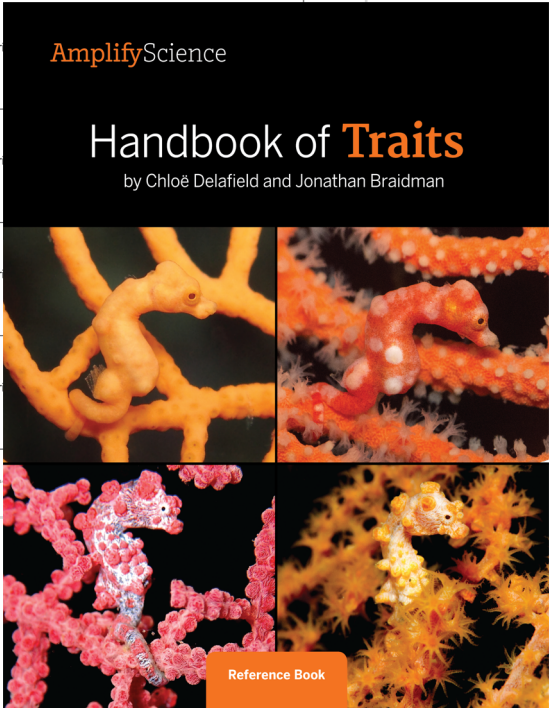
I can **record** this in my notebook.

Name: _____ Date: _____

Evidence About Trait Variation

Directions:

1. Read about at least one plant and one animal in *Handbook of Traits*.
2. In the boxes below, record the name of a plant or an animal and list some of the traits that have variation.

Organism: Traits that have var	
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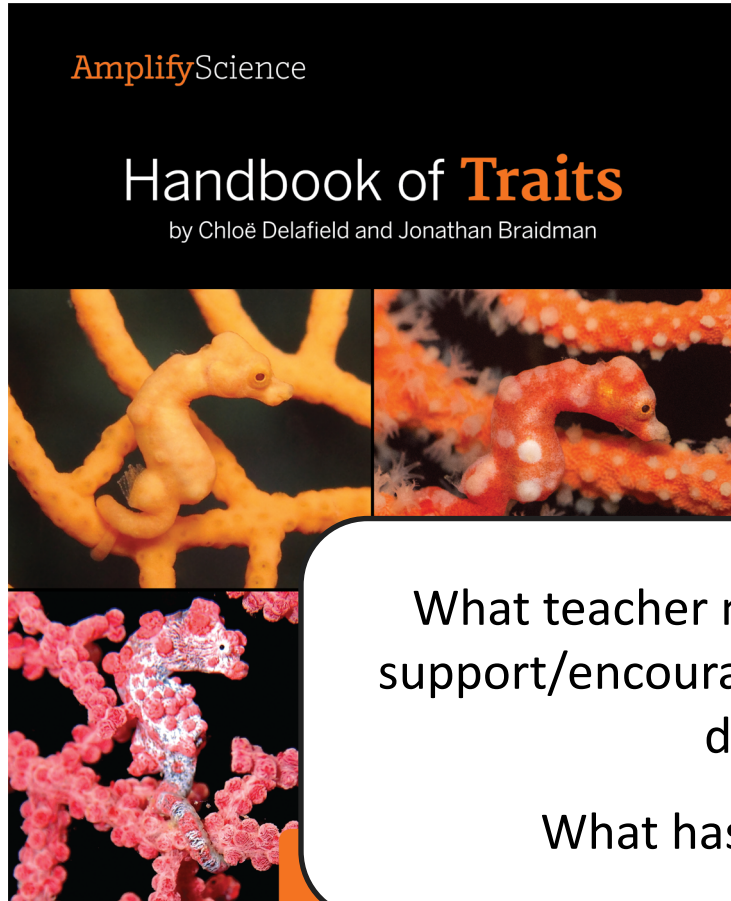
16

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Read about different animals and plants.

Use the notebook page to **record variations** you find.



What is some **evidence** you gathered to support the idea that traits can **vary within a species?**

What teacher moves/routines could be added to support/encourage ALL students to engage with the discussion questions?

What has worked in your classroom?

organism

Inference and Traits—Vocabulary—Lesson 1.2—AMP0573.16-3L5A
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trait

Inference and Traits—Vocabulary—Lesson 1.3—AMP0573.16-3L5A
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species

Inference and Traits—Vocabulary—Lesson 1.4—AMP0573.16-3L5A
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variation

Inference and Traits—Vocabulary—Lesson 1.4—AMP0573.16-3L5A
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We will be doing a Word Relationships routine to use **important science words** to think about the ideas you are learning.

Name: _____ Date: _____

Word Relationships

Directions:

1. Work with your group to create sentences that use at least two of the word cards in each sentence.
2. Create some sentences that explain what you have been learning about traits.
3. Record a few of the sentences you created.
4. With your group, choose one sentence to share with the class.

variation trait organism species

1. _____

_____2. _____

_____3. _____

_____4. _____

Turn to page xx, **Word Relationships**, in your notebooks.

You will work with a group to **make sentences** with word cards.

Then, you can record and share your sentences.



I can use these two words to talk about traits of organisms, like this:

Organisms can have different traits.

Name: _____ Date: _____

Word Relationships

Directions:

1. Work with your group to create sentences that use at least two of the word cards in each sentence.
2. Create some sentences that explain what you have been learning about traits.
3. Record a few of the sentences you created.
4. With your group, choose one sentence to share with the class.

variation trait organism species

1. _____

2. _____

3. _____

4. _____



Create sentences using the Word Relationship cards.



Does anyone have any new ideas about how we can describe the **traits in a species**?

Key Concept

Organisms in a species have many similar traits, but for each trait there can be variation.

Inheritance and Traits: Variation in Wolves

What is the origin of the traits of Wolf 44—a wolf that appears different from the rest of its pack?

Pg.
XX

Why are wolves different even though they are all the same species? (introduced in 1.4)

What are some ways that organisms can be similar or different? (1.1-1.4)

How can we describe the traits of organisms in a species? (1.5-1.6)

- Read *Blue Whales and Butterflies* (1.1)
- Reflect on relatedness (1.2)
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What are students figuring out?

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- Construct bar graphs to analyze similarity and variation in students' traits (1.5)
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Organisms in a species have many similar traits, but for each trait there can be variation. (1.6)

- Review wolf data and reflect on variation of traits within the wolf pack (1.7)
- Write class explanation about why wolves differ even though they are all the same species (1.7)

Even though all wolves are the same species, some wolves are different from others due to variation of traits within a species. Even though wolves can have similarities in their traits, there can also be variations in each trait. For example, some wolves have a trait for gray fur, others have a trait for black fur.

Why post this key concept now?

The problem students work to solve

Chapter 1 Question

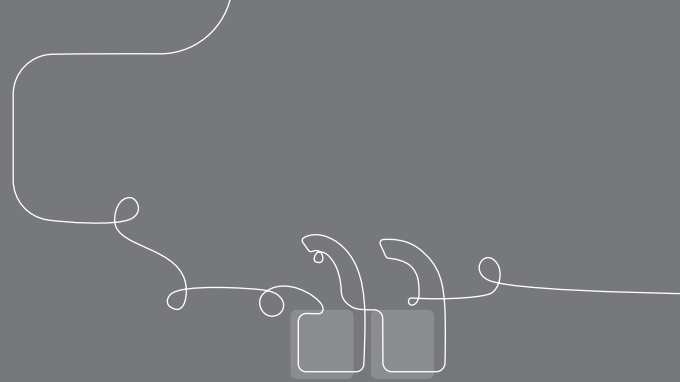
Investigation Questions

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to the problem

Explanation that students can make to answer the Chapter 1 Question

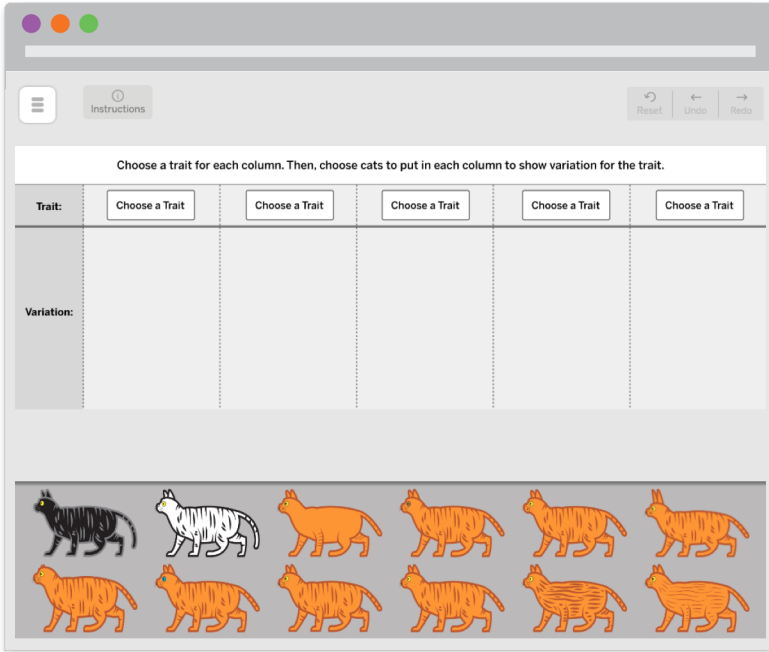


Turn and talk:

- Why do you think the key concept was posted at this point in the chapter?

Engaging with ideas over multiple activities

- Supports all learners
- Supports making connections
- Provides different, related pieces of evidence
- Models what scientists do
- Situates concepts in a variety of contexts



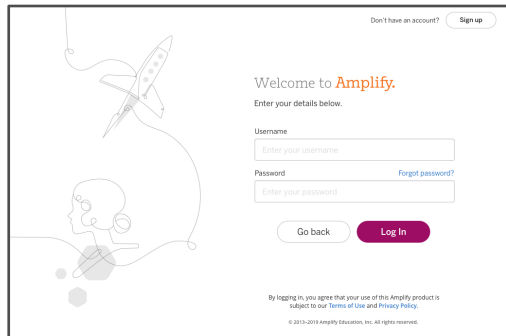
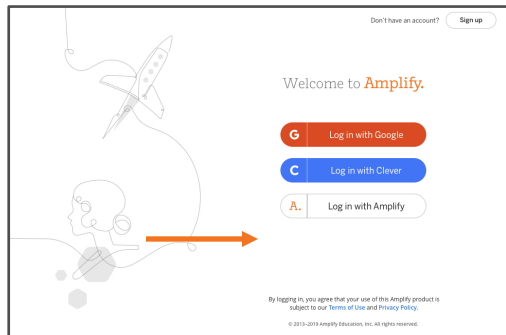
We will use what we learned to **make a model** that shows variation in a different organism—the domestic cat.

We'll use a **digital app** to create our models.

Guidelines for Using Apps

- Only one person “drives” at a time.
- Anyone can make suggestions about how to use the app.
- Talk about what you observe.
- Rotate the role of “driver.”

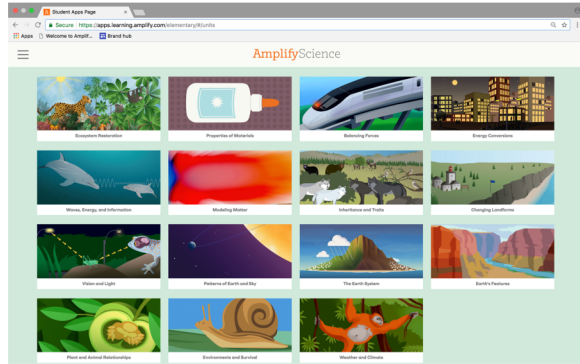
Welcome to Amplify Science!



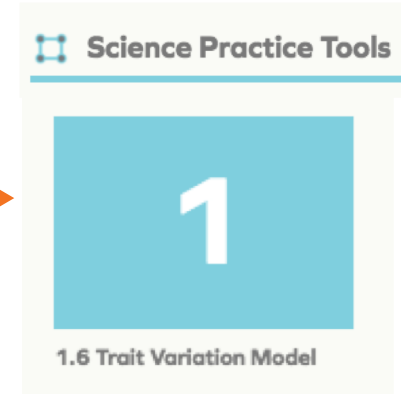
1. Make a name tent
2. Go to learning.amplify.com
3. Select **Log in with Amplify**
4. Enter teacher demo account credentials
 - XXXX@tryamplify.net
 - Password: AmplifyNumber1
5. Explore as we wait to begin

Navigating to the Modeling Tool

Safari or Chrome



Inheritance and Traits



1. Go to apps.learning.amplify.com/elementary
2. Click on Inheritance and Traits
3. Select Box 1 under Science Practice Tools

Inheritance and Traits: Variation in Wolves

What is the origin of the traits of Wolf 44—a wolf that appears different from the rest of its pack?

Why are wolves different even though they are all the same species? (introduced in 1.4)

Pg.
XX

What are some ways that organisms can be similar or different? (1.1-1.4)

How can we describe the traits of organisms in a species? (1.5-1.6)

- Read *Blue Whales and Butterflies* (1.1)
- Reflect on relatedness (1.2)
- Observe similarities and differences in organisms (1.3)
- Observe bird traits (1.3)
- Observe bird sounds (1.4)
- Observe bear traits (1.4)

What are students figuring out?
What can we explain with these ideas?

- Look for patterns in the wolf pack (1.5)
- Construct bar graphs to analyze similarity and variation in students' traits (1.5)
- Read *Handbook of Traits* to gather info about how traits vary within a species (1.6)
- Use Word Relationships routine to reflect on learning across the chapter (1.6)
- Create digital models of trait variation (1.6)

Organisms have observable traits. (1.1-1.4)

Organisms in a species have many similar traits, but for each trait there can be variation. (1.6)

- Review wolf data and reflect on variation of traits within the wolf pack (1.7)
- Write class explanation about why wolves differ even though they are all the same species (1.7)

Even though all wolves are the same species, some wolves are different from others due to variation of traits within a species. This means that even though wolves can have similarities in their traits, there can also be variations in each trait. For example, wolves have different colors of fur: some wolves have a trait for gray fur, others have a trait for black fur.

The problem students work to solve

Chapter 1 Question

Investigation Questions

Evidence sources and reflection opportunities

Key concepts

Application of key concepts to the problem

Explanation that students can make to answer the Chapter 1 Question



Chapter 1: Why are wolves different even though they are all the same species?

☑ JUMP DOWN TO CHAPTER OVERVIEW

Lesson 1.1:

Pre-Unit Assessment

Lesson 1.2:

Blue Whales and Buttercups

Lesson 1.3:

Observing Similarities and Differences

Lesson 1.4:

Introducing Species

Lesson 1.5:

Variation in a Species

Lesson 1.6:

Making Sense of Variation

Lesson 1.7:

Explaining Variation



To: Graystone National Park's Wildlife Biologist Team
From: Second Grade Students, Graystone Elementary School
Subject: Elk Mountain Wolves

Hello Wildlife Biologist Team,

Our class is visiting Graystone National Park. We've been observing a pack of wolves, and we have a question for you. Why are the wolves different from one another even though they are all the same species? Why does Wolf 44 look so different? (We observed that it is light colored, and all the others are dark colored.) We are hoping that you can explain the answer to these questions.

Thank you!

Name: _____ Date: _____

Gathering Information About Wolves

Directions:

1. With your group, use data from the Elk Mountain Pack Data Cards and information from the books to help you answer the questions on the next page.
2. You can use the scientific language below to help you talk about the data from the cards.

Scientific language terms

- I observed on the cards that _____.
- I read in *Handbook of Traits* that _____.
- I read in *Blue Whales* that _____.

20

© 2018 The Regents

Name: _____ Date: _____

Gathering Information About Wolves (continued)

Part 1
What variation did you observe in the photographs of the wolves on the data cards?

Part 2
What did you learn about differences in species? Give examples from *Blue Whales* and *Buttercups* and *Handbook of Traits*.

Part 3
What science words will you use to share your ideas about differences in wolves?

Inheritance and Traits—Lesson 1.7 **21**

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Turn to **pages xx-xx** in your notebooks.

Let's review the **directions for each part** of this activity.

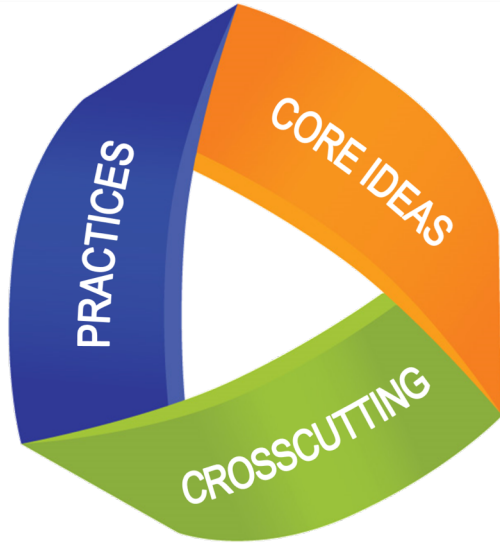
What Is a Scientific Explanation?

1. It answers a question about how or why something happens.
2. It is based on the ideas you have learned from investigations and text.
3. It uses scientific language.
4. It is written for an audience.

Question: Why are wolves different from one another even though they are all the same species?

Some wolves are different than others even though they are all the same species because there is variation of traits within a species. This means that even though the wolves are the same species and can have similarities in their traits, there can also be variation in each of their traits. For example, the wolves have different color fur. Some of the wolves have a trait for gray fur, and others have a trait for black fur.

Thinking three dimensionally



Disciplinary Core Ideas

- Refer to the key concepts

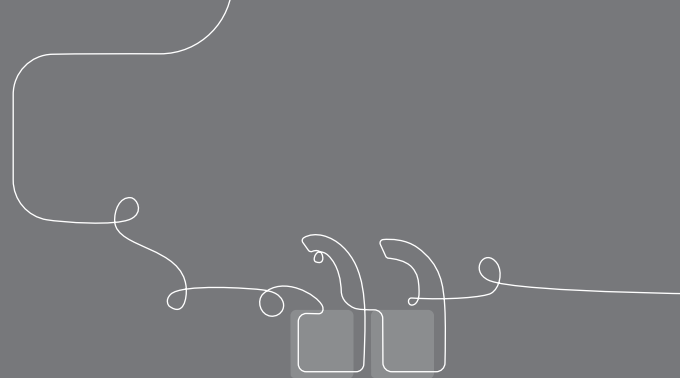
Science and Engineering Practices

- Which practices did you use to figure out these ideas?

Crosscutting Concepts

- Which crosscutting concepts were useful to make sense of what you figured out?

Questions?



Stop and Jot on your way to lunch

Rate your comfort with the following statement from 1-4


(4 being very comfortable):

I understand how activities within a lesson support students with building complex explanations.

3!

I am wondering about...

Please also note any needs or wonderings for the afternoon!



Inheritance and Traits

Plan for the day

- Framing and reflection
- Experiencing the unit
- **The story of the unit**
- Planning to teach
- Closing

The story of the unit

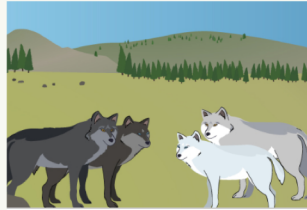
The purpose of this part of the day is for you to:

- Understand how students build and apply science knowledge throughout Inheritance and Traits.
- Apply this understanding to the End-of-Unit Assessment.
- Leverage the progress builds to gauge student understanding throughout the unit.



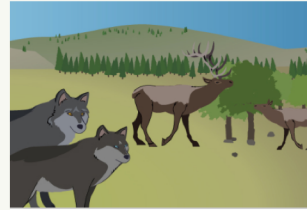
Chapter 1: Why are wolves different even though they are all the same species?

7 Lessons



Chapter 2: Why is Wolf 44's color similar to one pack but different from...

6 Lessons



Chapter 3: Why isn't Wolf 44 like the Bison Valley Pack in hunting style and...

6 Lessons



Chapter 4: How can scientists investigate questions about traits?

3 Lessons

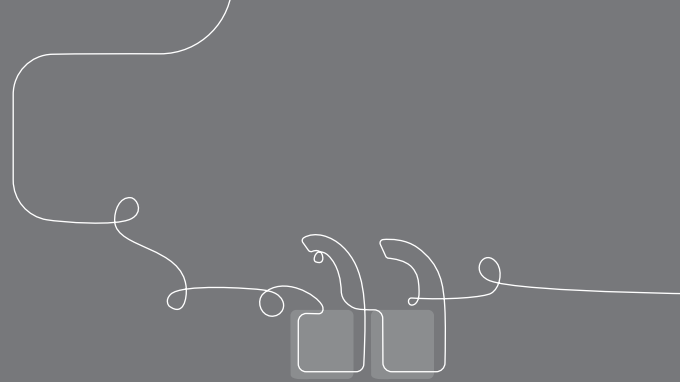
Chapter 1 key concepts and explanation

Why are wolves different even though they are the same species?

Pg.
xx

Ch	Key concepts	Explanation
1	<p>Organisms have observable traits. (1.3)</p> <p>Organisms in a species have many similar traits, but for each trait there can be variation. (1.6)</p>	<p>Even though all wolves are the same species, some wolves are different from others due to variation of traits within a species. This means that even though wolves can have similarities in their traits, there can also be variations in each trait. For example, wolves have different colors of fur some wolves have a trait for gray fur, others have a trait for black fur.</p>

There are variations in the color of fur in the wolf species.



Turn and talk:

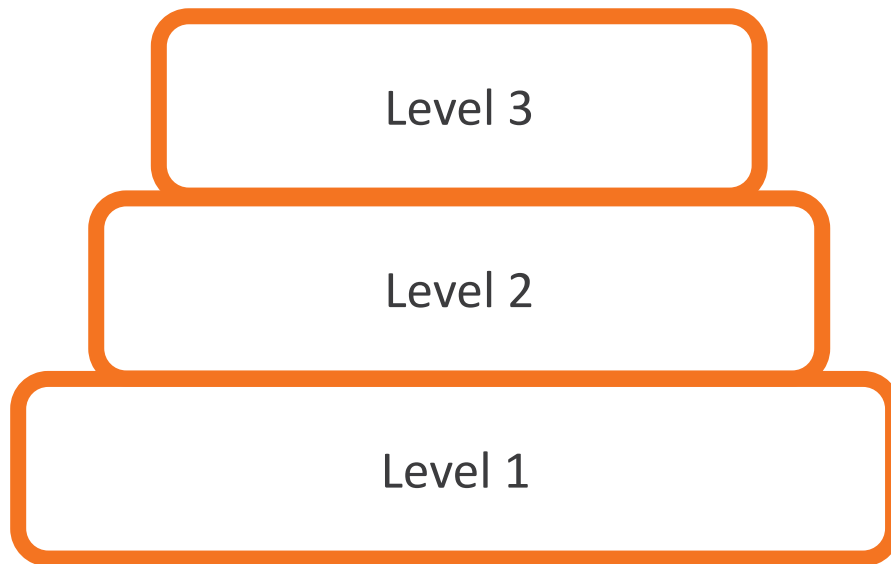
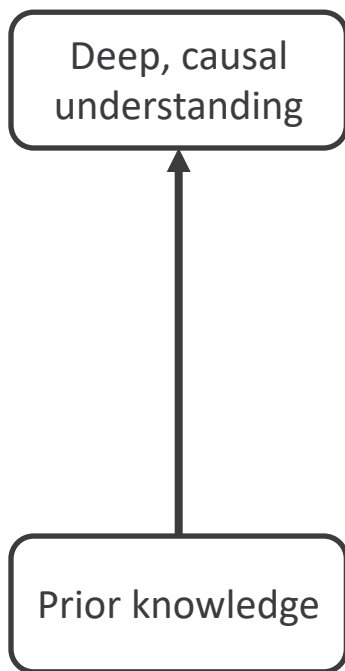
- How does formalizing conceptual understanding by posting key concepts support students in solving the unit problem?

Ch Key concepts

Explanation

- 1 Organisms have observable traits. (1.3)
- Organisms in a species have many similar traits, but for each trait there can be variation. (1.6)
- Even though all wolves are the same species, some wolves are different from others due to variation of traits within a species. This means that even though wolves can have similarities in their traits, there can also be variations in each trait. For example, wolves have different colors of fur. Some wolves have a trait for gray fur, others have a trait for black fur.
-
- 2 Organisms can have traits that are similar to their parents' traits. (2.2)
- Offspring inherit instructions for each trait from both their parents. (2.5)
- Wolf 44's color is similar to the wolves in the Bison Valley Pack because its parents are in the Bison Valley Pack. Offspring inherit instructions for each trait from both parents. This means that the trait of fur color comes from Wolf 44's parents.
-

Progress Build: A unit-specific learning progression



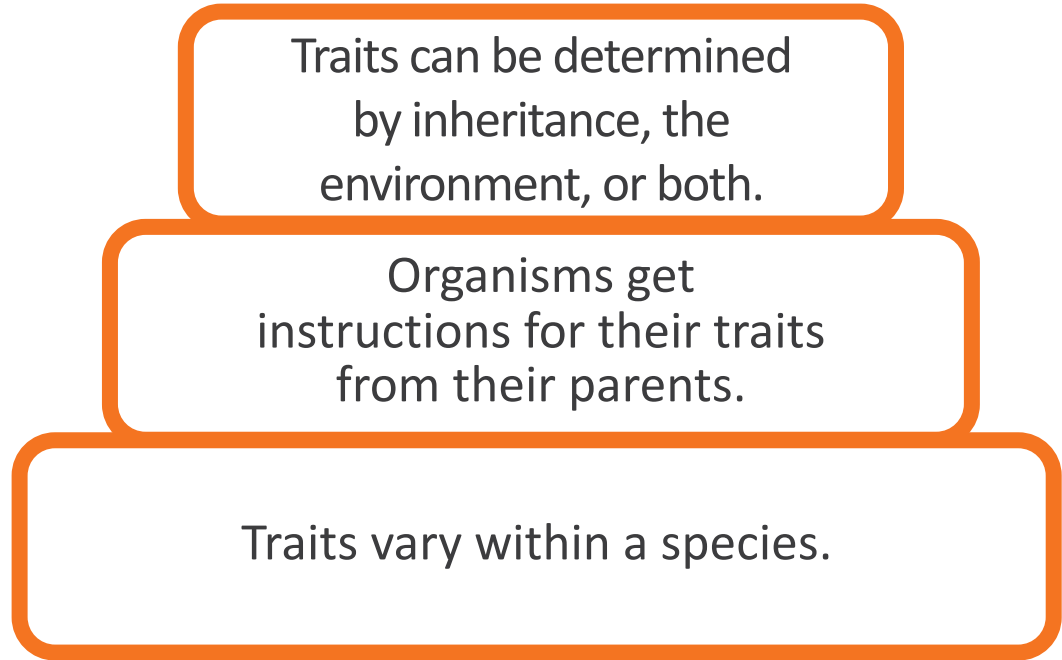
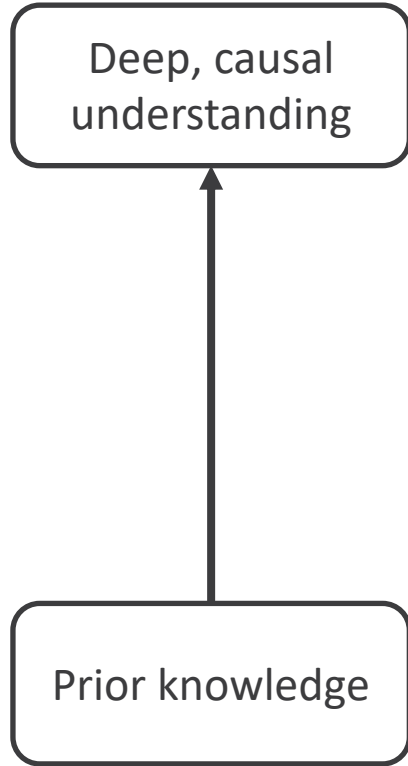
In your group take turns sharing...

- Which ideas are revisited over multiple chapters? (started as foundational but built upon throughout your model?)
- What new ideas are added in each level of your build? (how did you represent new ideas in your model?)

Listening group:

-Listen for what is the same or different about the other group's visual to your own.

Inheritance and Traits Progress Build



End-of-Unit Assessment



Anticipatory turn and talk

Reflect on the End-of-Unit Assessment in your last unit

- What kind of data did you gather from the End-of-Unit Assessment?
- What did you like about the End-of-Unit Assessment?
- What did you find challenging about the End-of-Unit Assessment?

Name: _____ Date: _____

End-of-Unit Writing: Explaining Wolf 44's Size

Directions:

- 1. Write a scientific explanation that answers the question below.
- 2. Your audience is the students of Graystone Elementary School.

Question: What makes Wolf 44 medium size?

Progress Build Level 1: Traits vary within a species.

There is a lot of variation in traits. Organisms in a species have many similar traits, but the traits they have vary within the species.

Name: _____ Date: _____

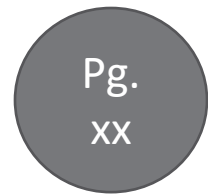
End-of-Unit Writing: Explaining Wolf 44's Size

Directions:

1. Write a scientific explanation that answers the question below.
2. Your audience is the students of Graystone Elementary School.

Question: What makes Wolf 44 medium size?

Wolf 44 is medium size because there can be variation among traits in a species. There is variation in size among wolves - some wolves can be larger, or smaller, and Wolf 44 is medium size.



Opportunities to monitor progress

What other embedded assessment opportunities can you use to help monitor progress up the Progress Build before students get to the End-of-Unit Assessment?

- Find the Critical Juncture opportunities and add these to your visual.
- Next, locate at least one On-the-Fly Assessment that can be used to progress monitor students' developing conceptual understanding leading up to each Critical Juncture.


Self-Reflection

- What kind of data did you gather from the End-of-Unit Assessment?
- What did you like about the End-of-Unit Assessment?
- What did you find challenging about the End-of-Unit Assessment?



Questions?





Inheritance and Traits

Plan for the day

- Framing and reflection
- Experiencing the unit
- The story of the unit
- **Planning to teach**
- Closing

Planning to teach

The purpose of this part of the day is for you to:

- Reflect on implementing Amplify Science in your classroom to select an area of growth.
- Engage in targeted small group practice in your area of growth.

Targeted small group work focus areas

- Deepening content understanding and addressing preconceptions
- Coherent instruction
- Formative assessment and differentiation
- Preparing to teach

Choosing a focus area


- While thinking about what to focus on, ask yourself:
 - For which category (1, 2, or 3) did I mark myself as “least comfortable”?
 - Did that change over the course of today’s workshop?
 - Is there a newly illuminated challenge area that I would rather focus on?
 - What would be most helpful to examine collaboratively in this space?

Setting up your targeted group work

- *With your group determine your focus or goal for the work time. Be prepared to share what you focused on, what you learned, and any remaining questions for the presenter.*

Focus area reflection

- Based on your work in your focus area, what will you keep in mind as you plan to teach your next unit?



Inheritance and Traits

Plan for the day

- Framing and reflection
- Experiencing the unit
- The story of the unit
- Planning to teach
- **Closing**

Questions?



NYC Resource Site

<https://www.amplify.com/amplify-science-nyc-doe-resources/>

Amplify.

Introduction

Getting started resources

Planning and implementation resources

Admin resources

Parent resources

Professional learning resources

Questions



Missing Materials

- Contact the Core Curriculum Service Center Monday-Friday 8am-5pm

Email: curriculum@schools.nyc.gov

Phone: (718) 935-3334

Thank you for your feedback!

Presenter Name:
Workshop Title:

