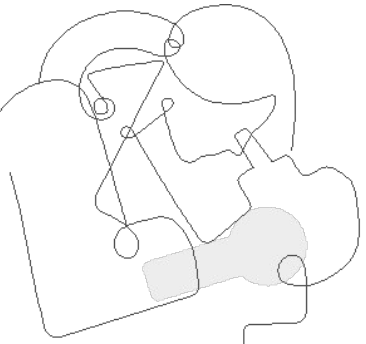
Amplify Science

The Assessment System

Grade 3, Unit 2: Inheritance and Traits

Part 3

Strengthen workshop



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Amplify's Purpose Statement

Dear teachers,

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

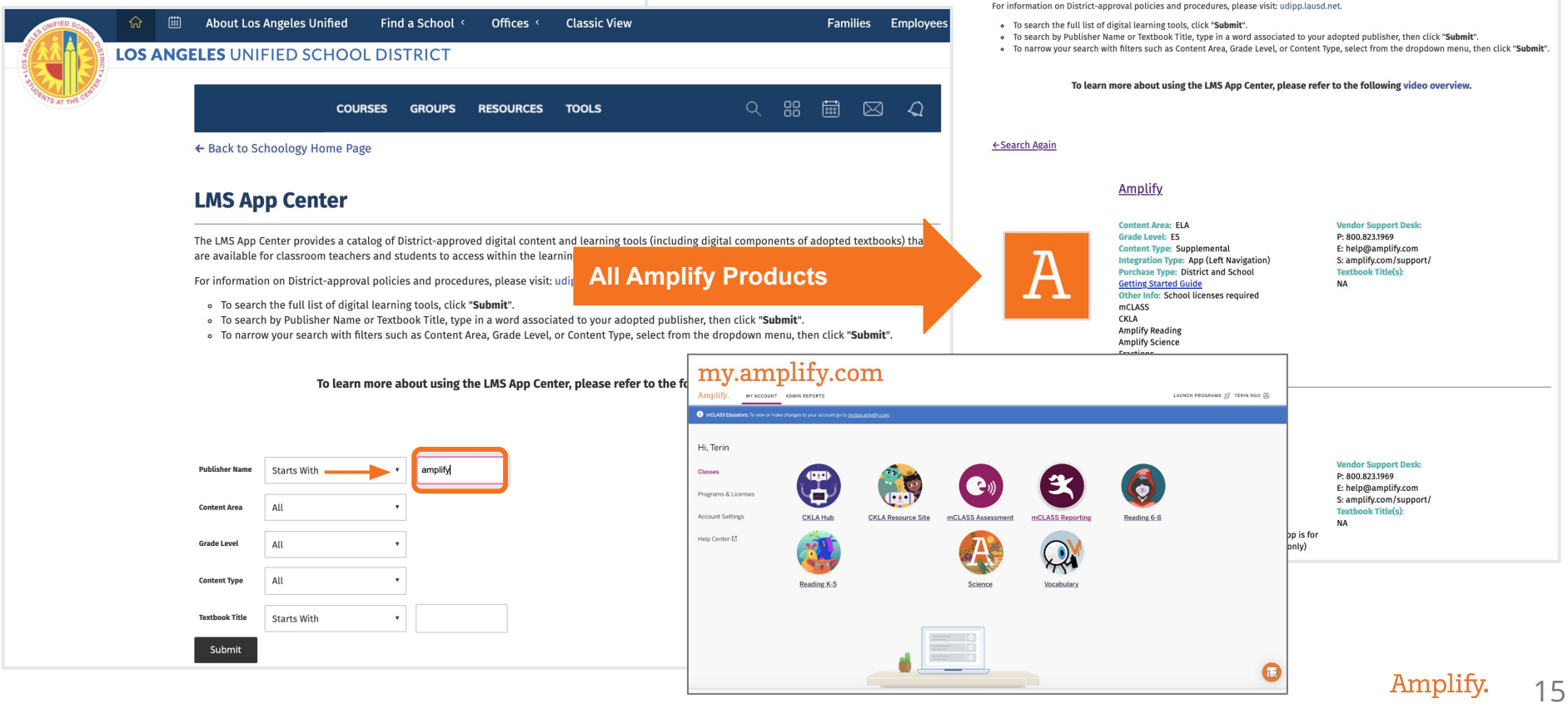
We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

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

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

Sincerely,
Amplify

Schoology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To join Amplify Science Schoology ES Group: W4PK-W466-63F5B

Navigation Temperature Check

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

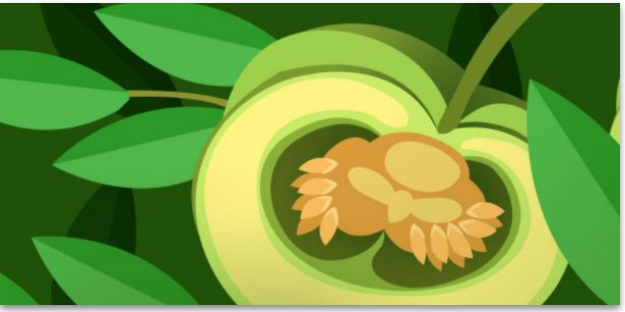
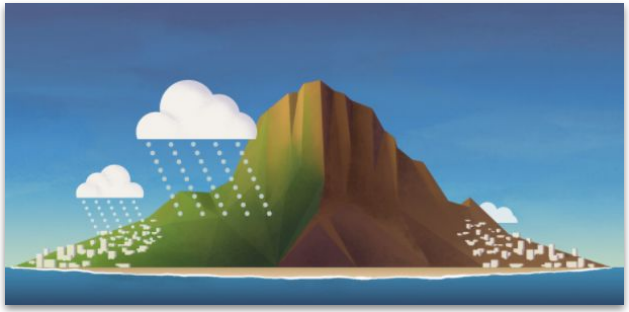
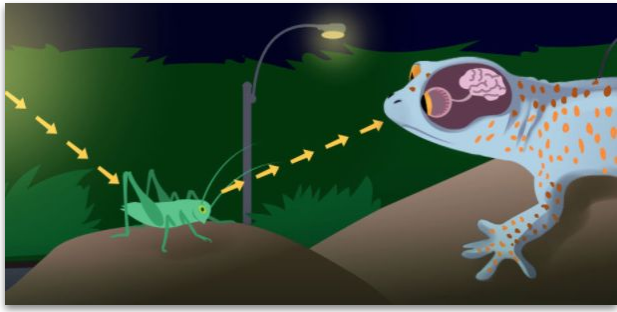
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable

Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Overarching goals

- Describe the structure and purpose of the Amplify Science Assessment System
- Plan for the strategic use of assessment resources to analyze and respond to student work

Norms: Establishing a culture of learners

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

Opening reflection

Why do we assess our students?

What is **challenging** about assessing our students?

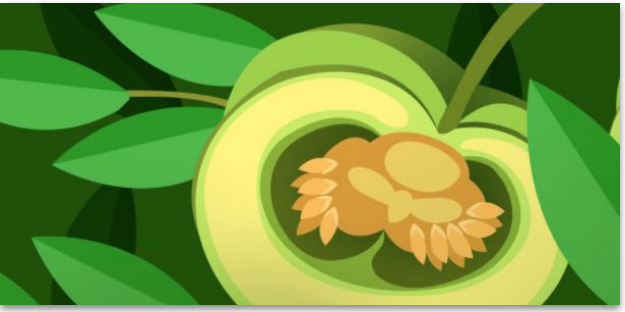
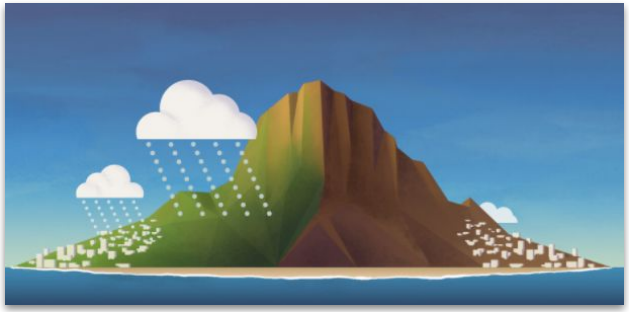
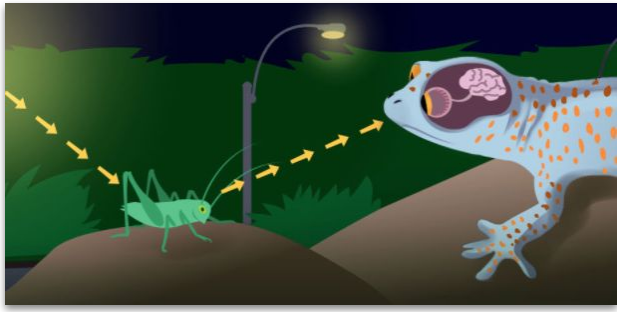
Participant Notebook

http://bit.ly/3ORGP9H

Opening Reflection: Assessment

Why do we assess our students?

Why do we assess our students?

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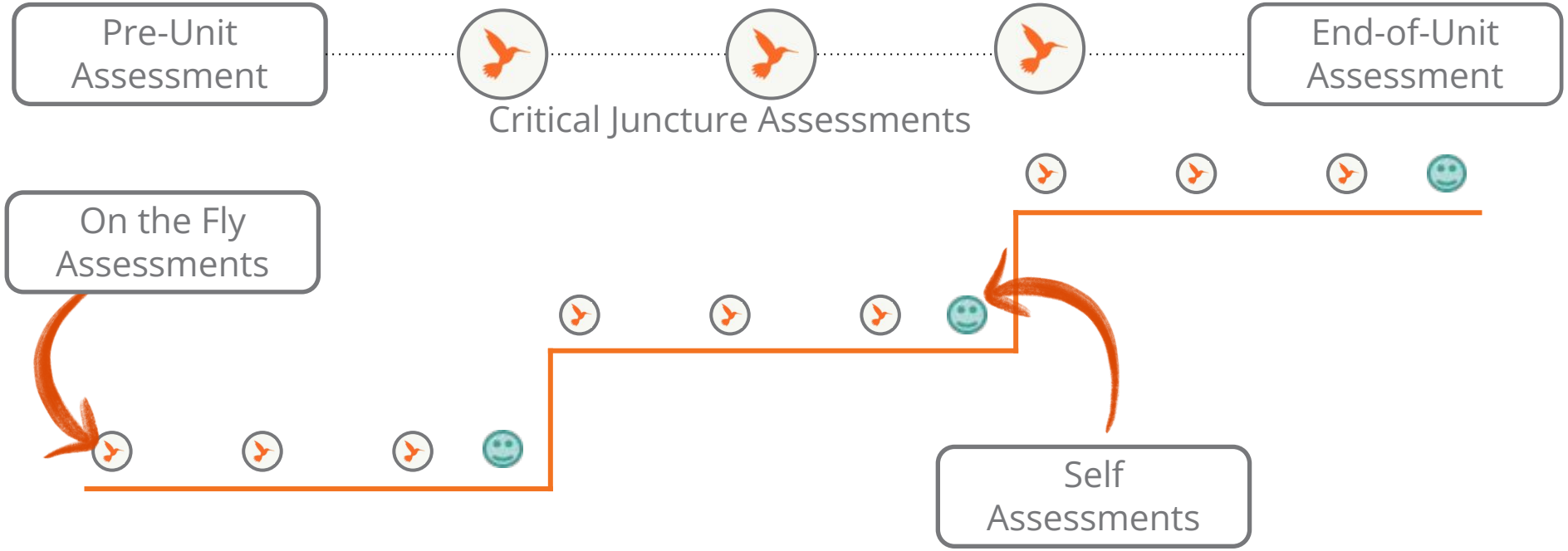
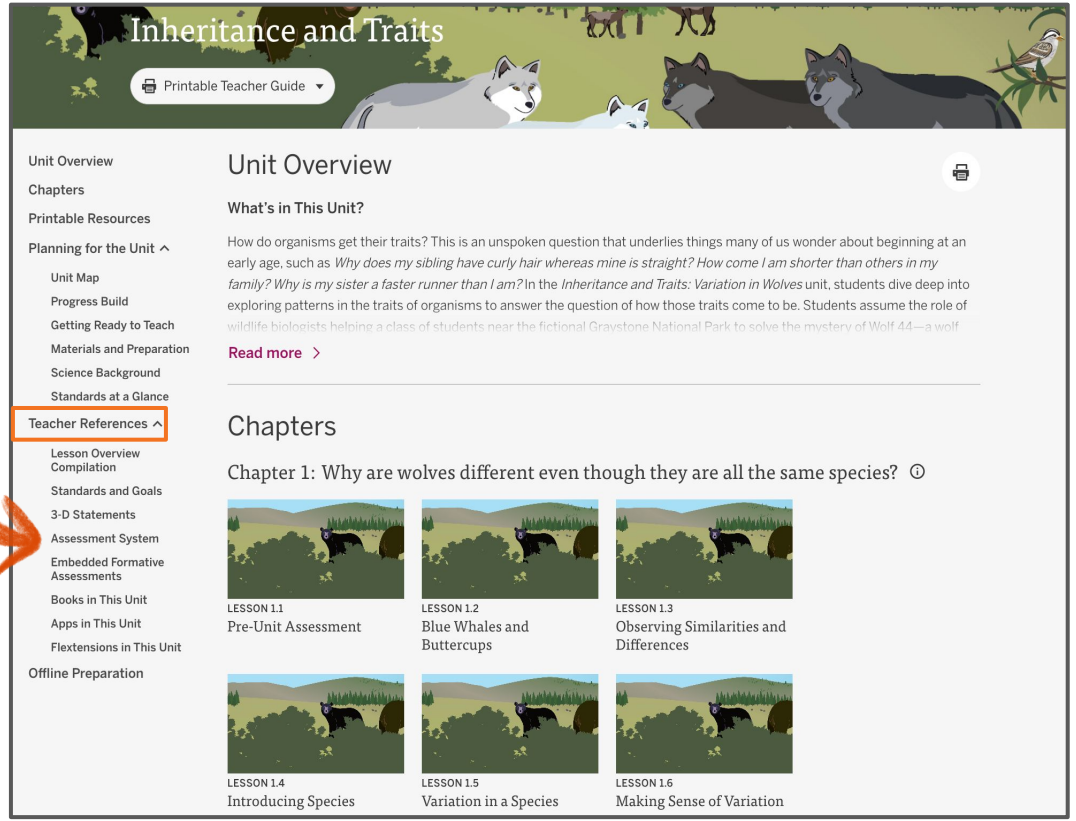
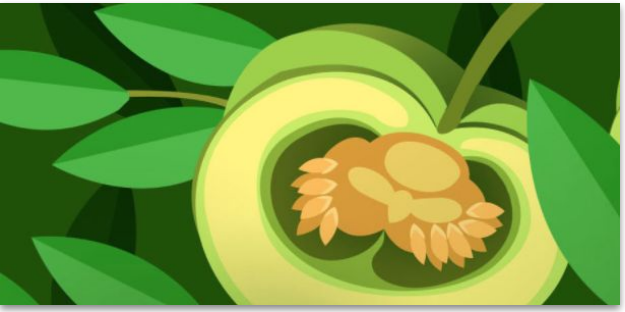
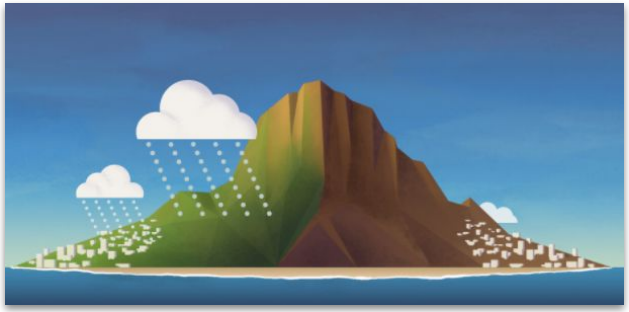
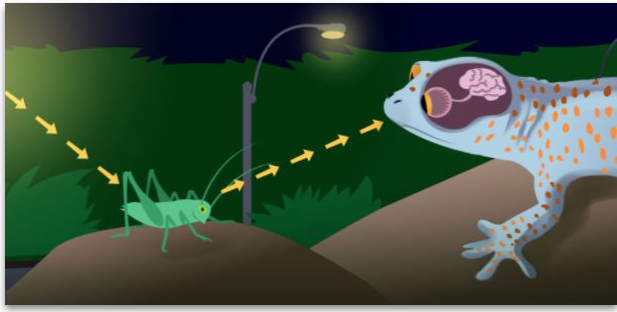
K-5 Assessment System



Assessment System Document



Questions?

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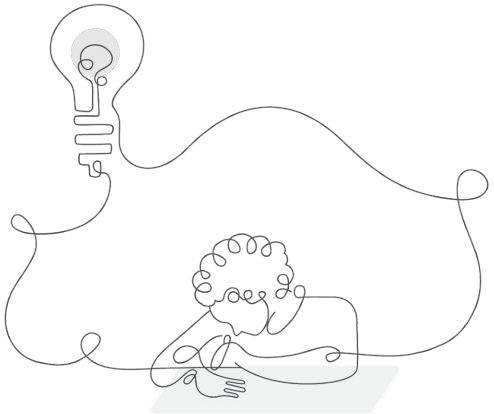
Reviewing the unit phenomenon

Inheritance and Traits

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



Inheritance and Traits

Problem: Why does Wolf 44 appear different from the rest of the wolves in its pack?

Role: Wildlife Biologists

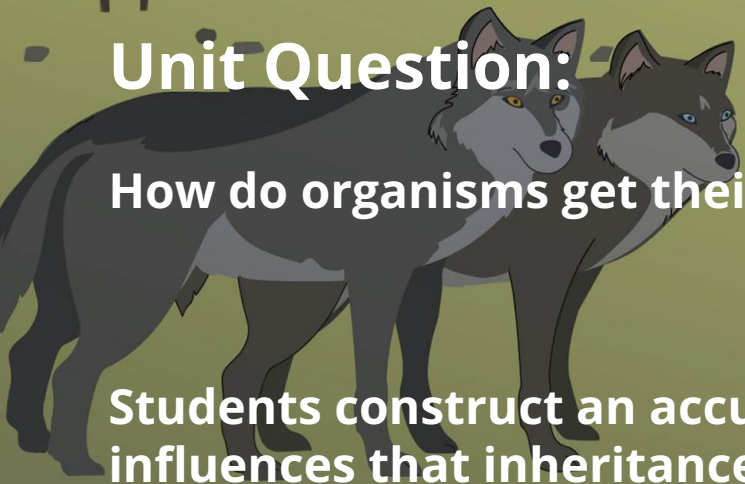
Students observe variation between and within different species, investigate inherited traits and those that result from the environment, and explain how Wolf 44 acquired certain traits.

Inheritance and Traits

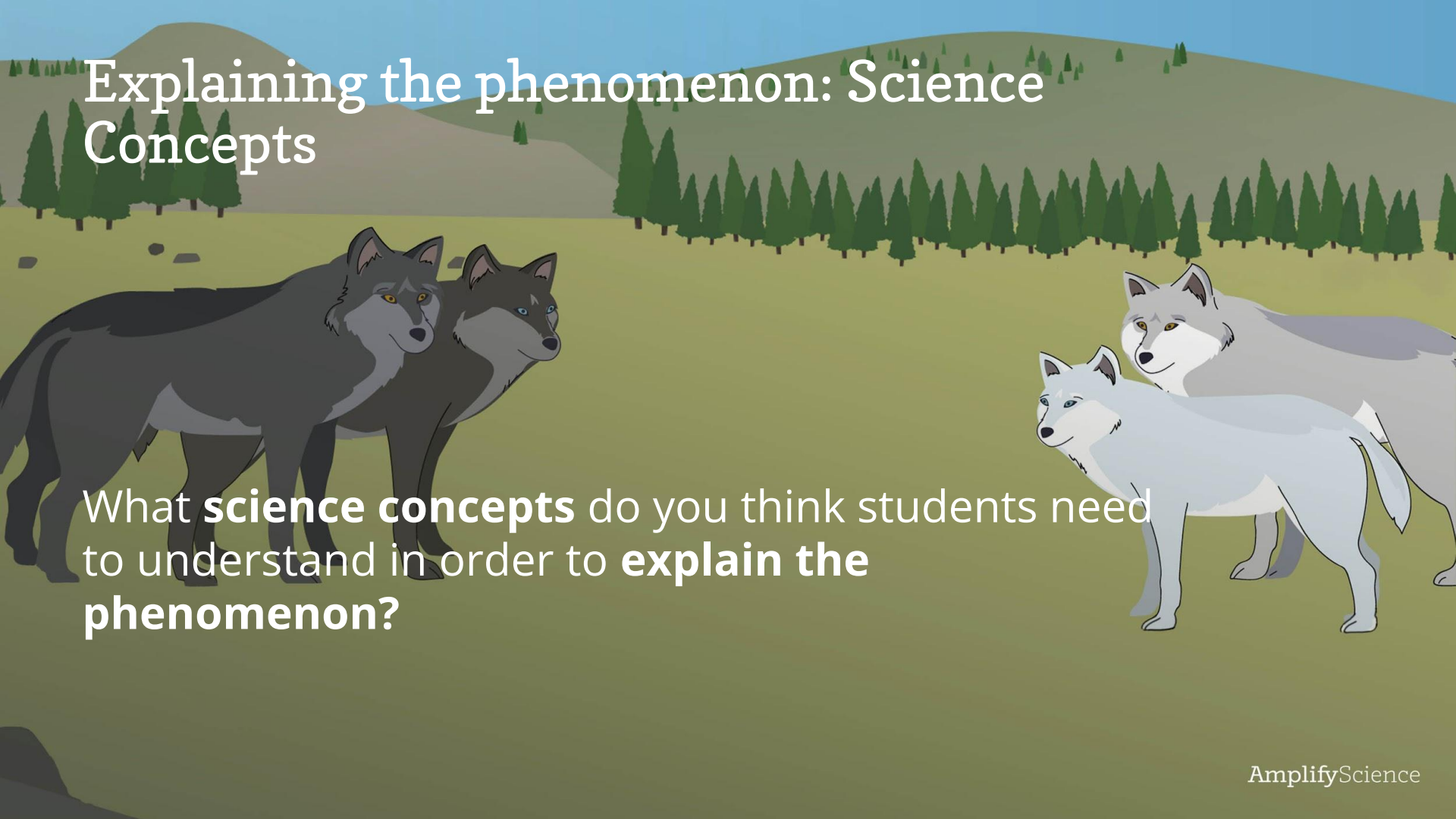
Unit Question:

How do organisms get their traits?

Students construct an accurate understanding of the influences that inheritance and the environment play in determining organisms' traits.



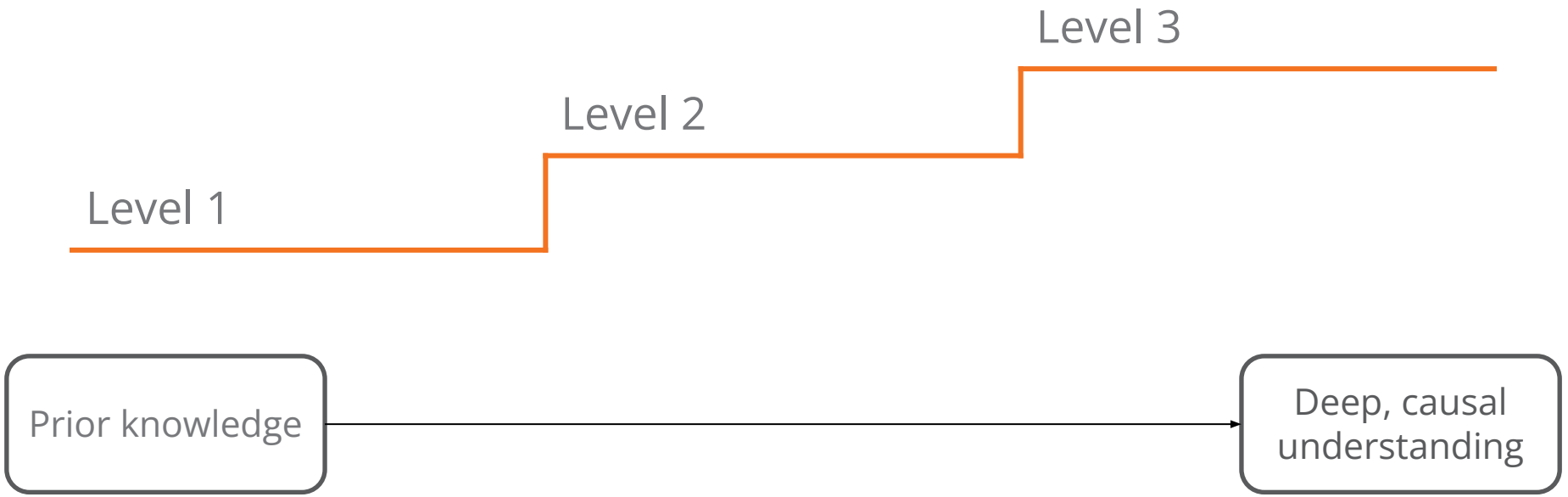
Explaining the phenomenon: Science Concepts



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

Progress Build

A unit-specific learning progression

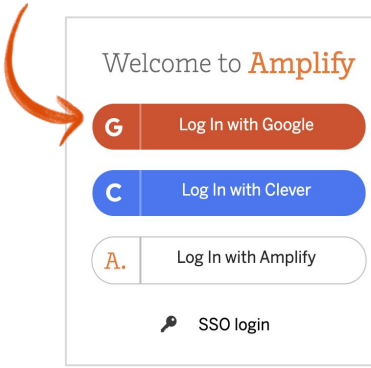


Logging in (demo account)

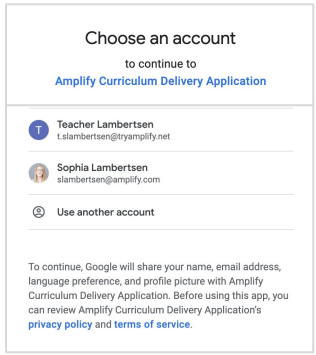
Safari or Chrome

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

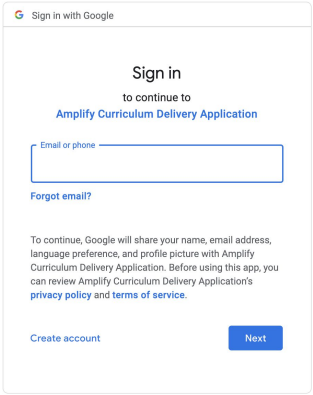
Steps 1-2

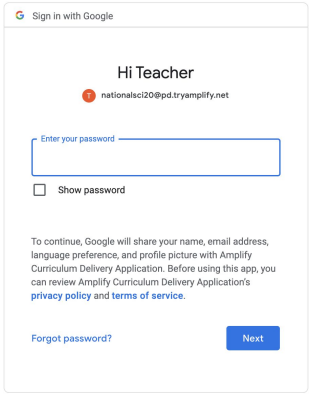


Step 3



Step 4



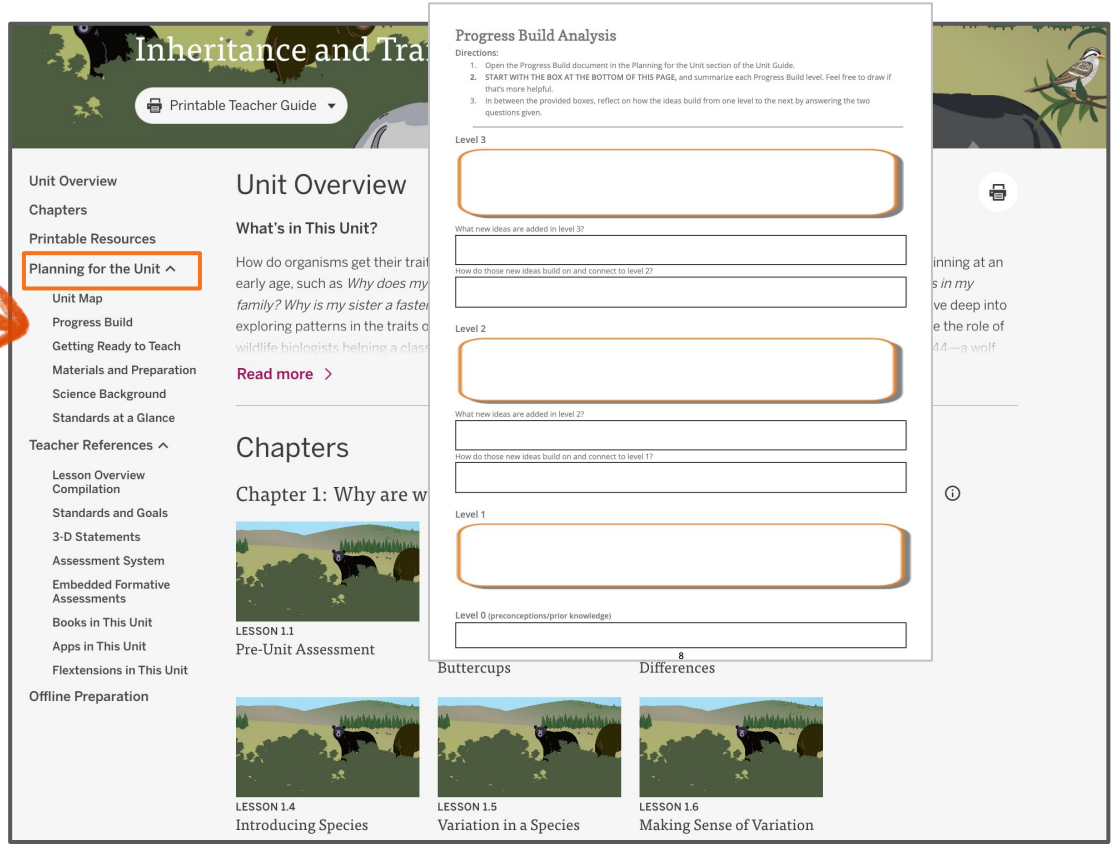


Progress Build analysis

Work time

Read and analyze your unit's Progress Build.

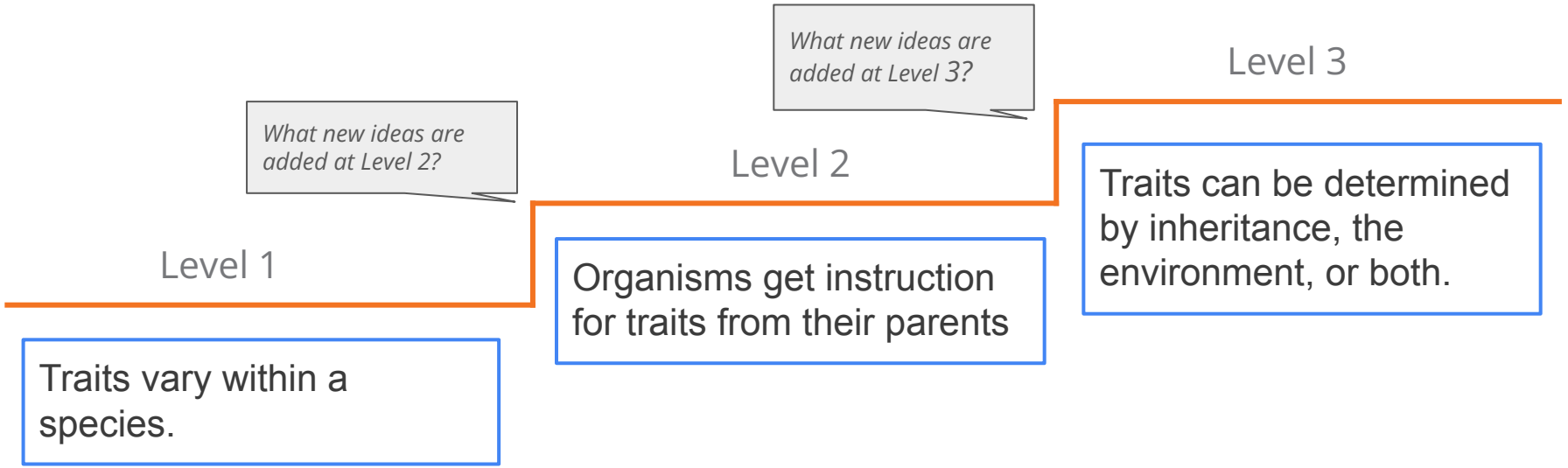
Pgs. 7,8



Progress Build

Inheritance and Traits

Assumed prior knowledge (preconceptions): Students are likely to understand (and to have experienced) that individuals in a family tend to share similarities, although it is not expected that students have formal ideas about inheritance.



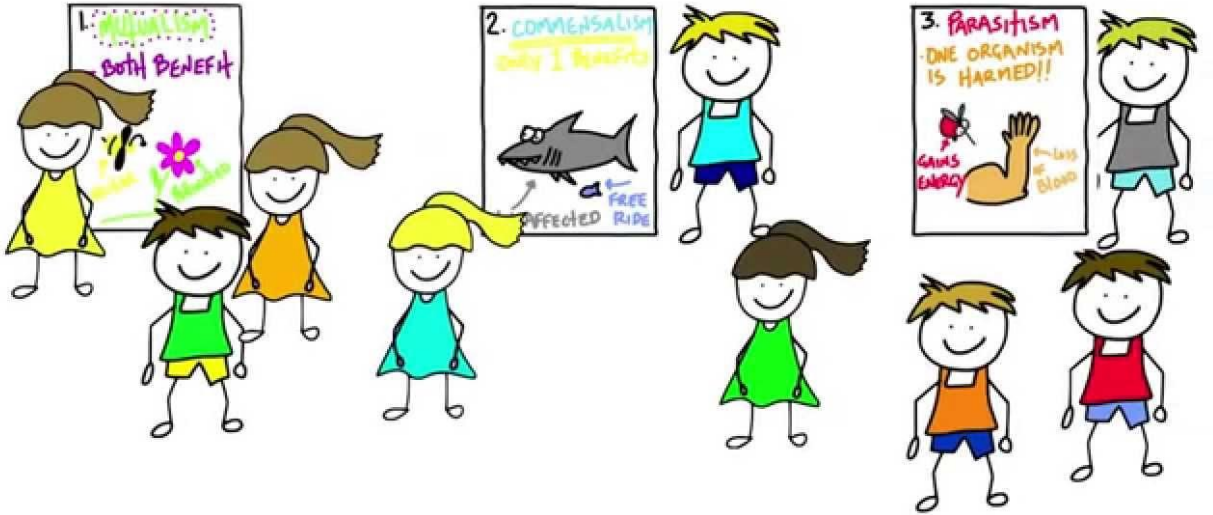
Progress Build analysis

Group work time

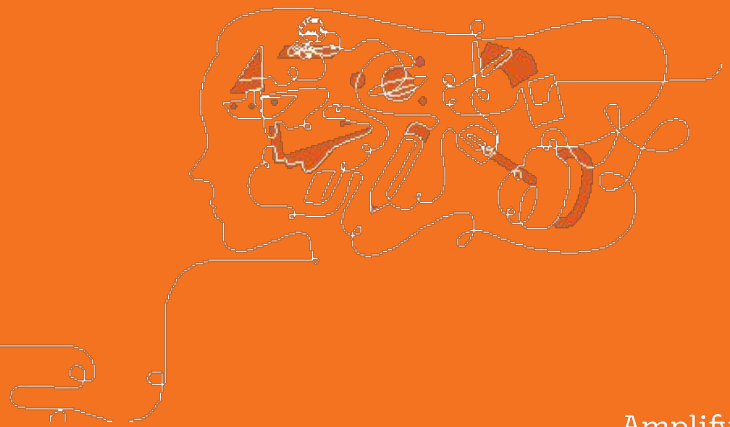
- With your group or partner, create a visual representation of one level of the progress build.

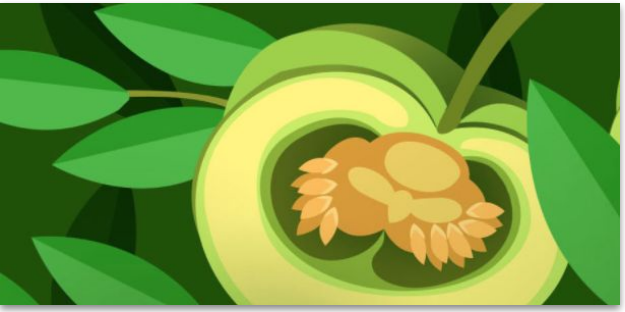
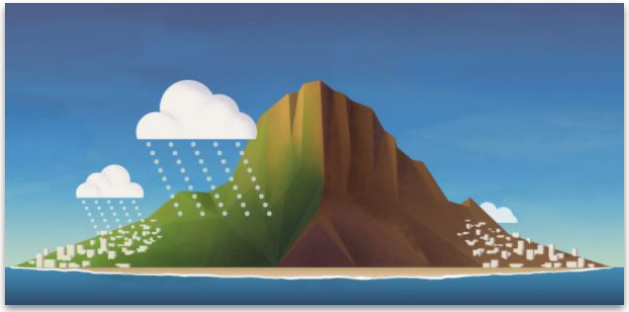
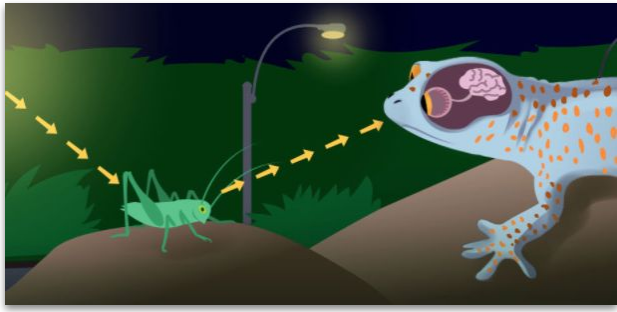
Progress Build analysis

Gallery Walk



Break



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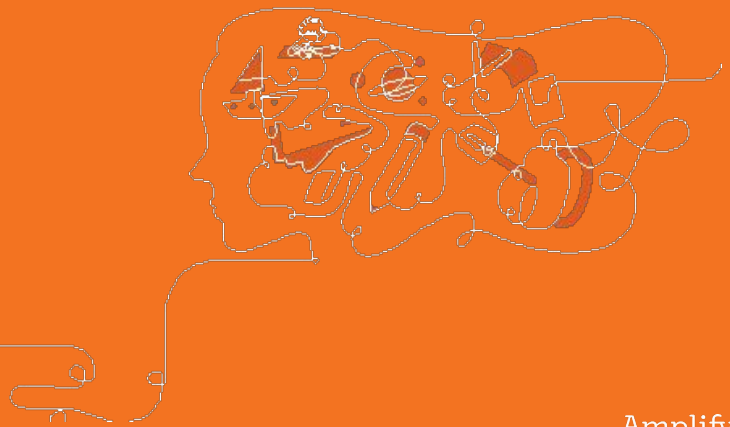
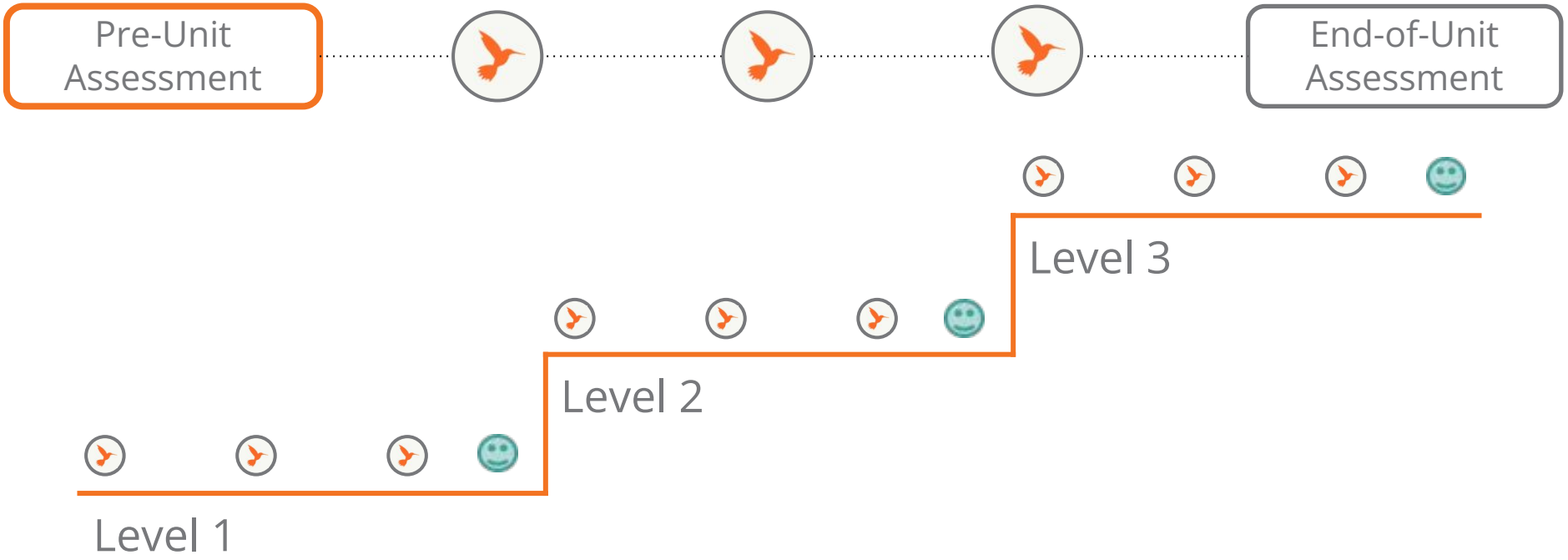
Pre-Unit Assessment



Pre and End-of-Unit Assessment



Progress Build

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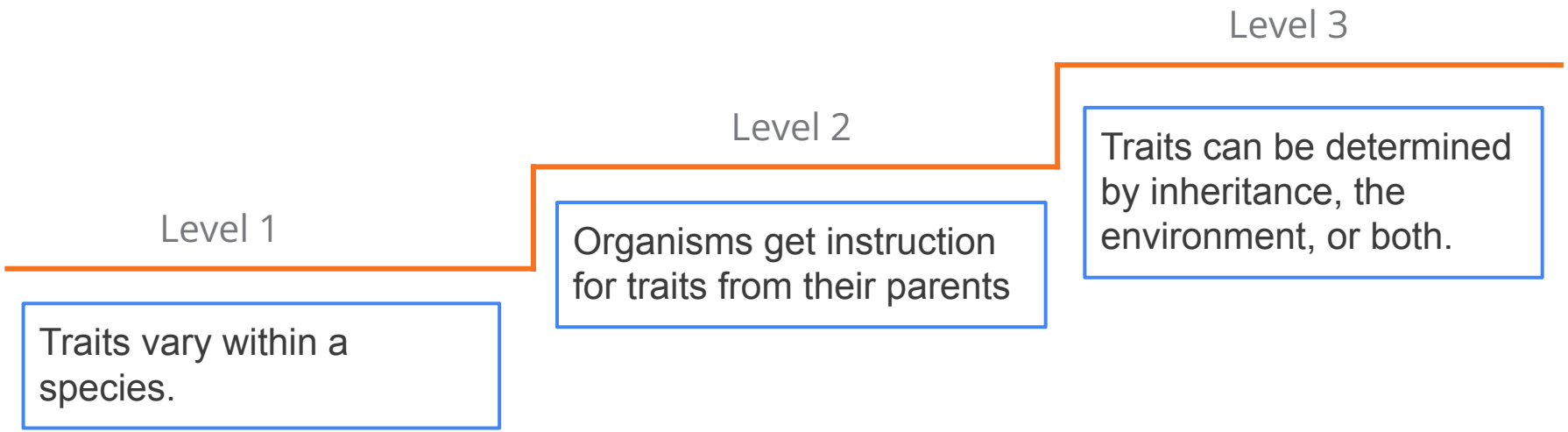
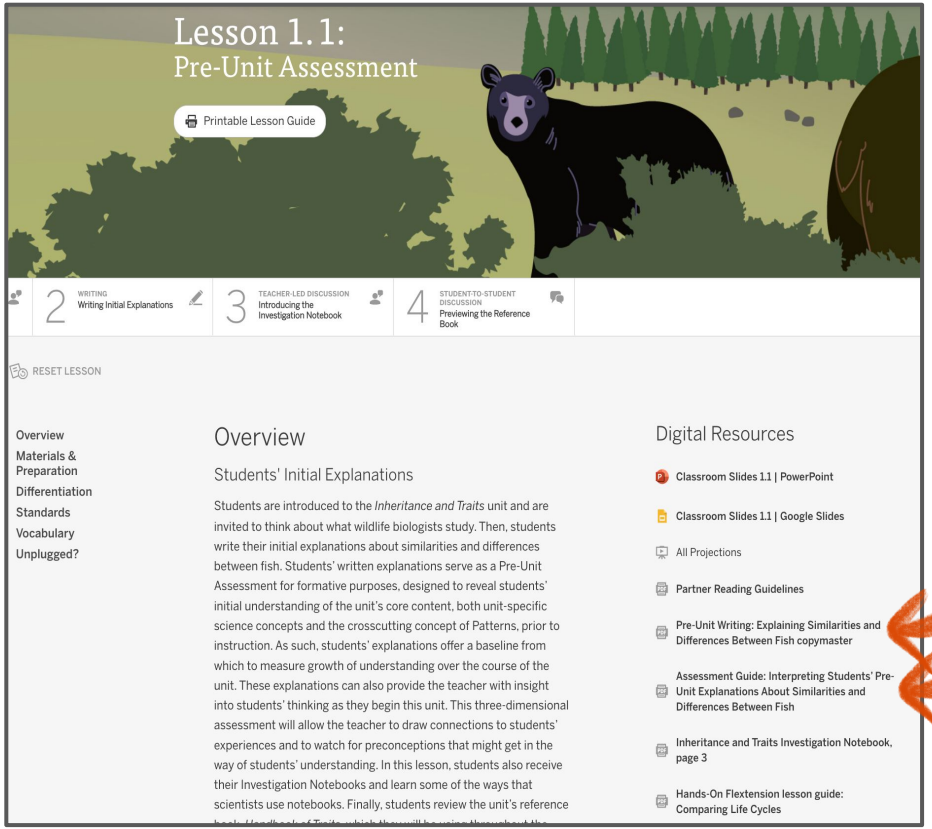


Pre-Unit Assessment

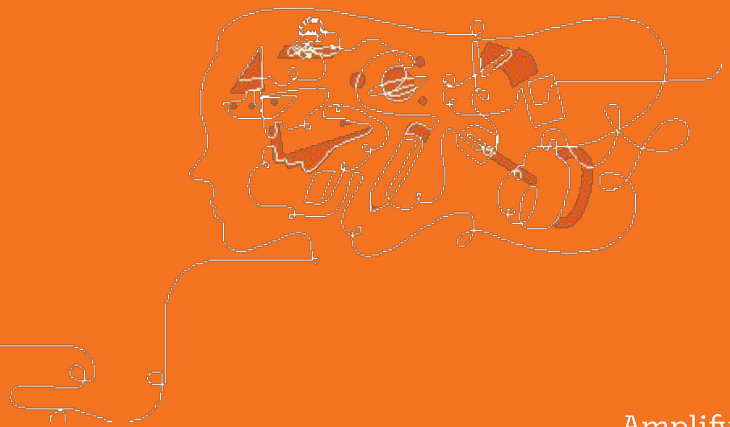
Lesson 1.1

Locate the Pre-Unit Assessment (Writing) and Assessment Guide in Lesson 1.1 of your unit and skim through them.

Open up the classroom slides and see how the pre-unit assessment is embedded in the lesson.



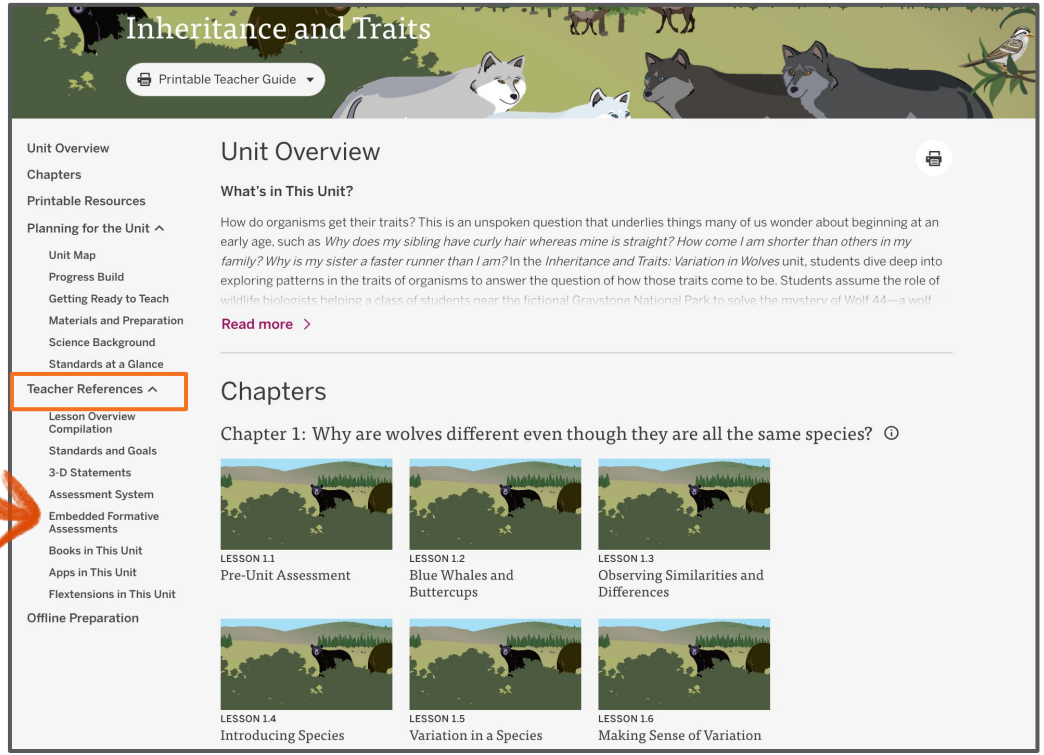
Formative Assessments



K-5 Assessment System

Formative Assessment Document

Inheritance and Traits



On-the-Fly Assessments

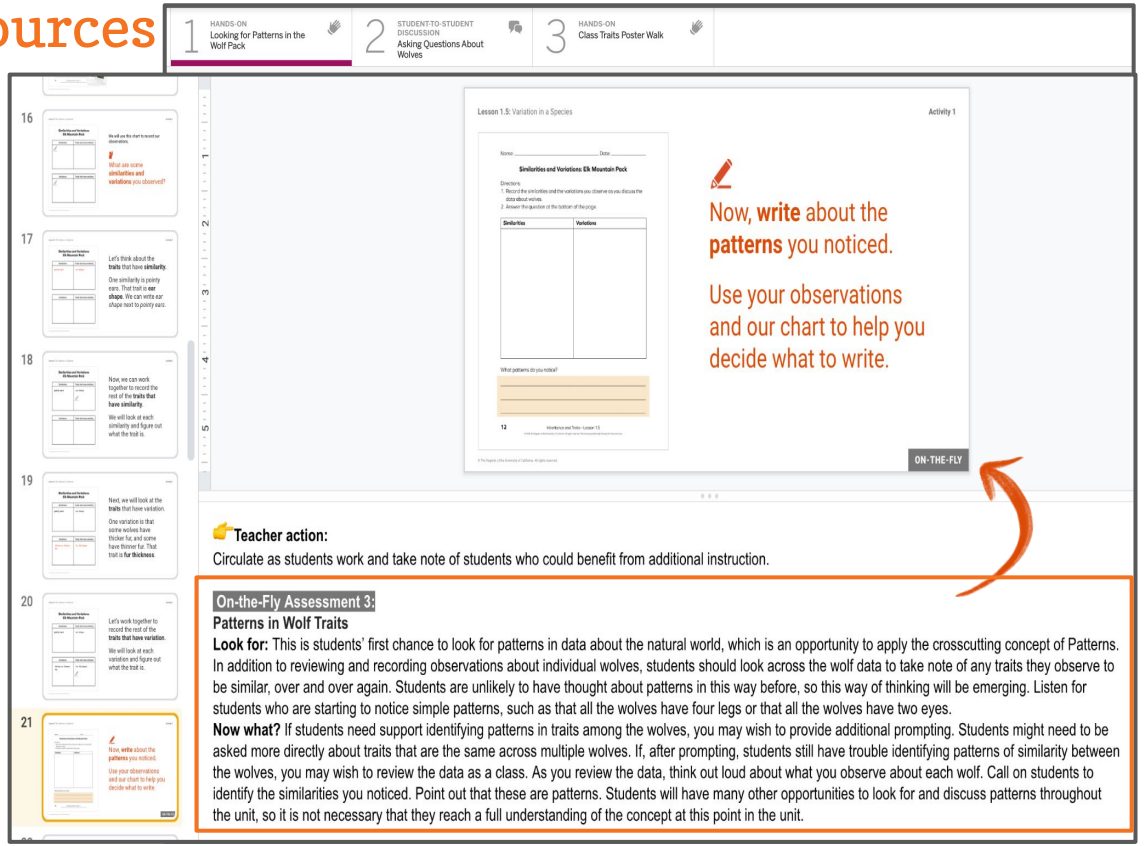
- Track student progress within a Progress Build level
- Embedded into instruction
- Assessment resource includes “Look for” and “Now what”
- Incremental build towards the Critical Juncture

Formative assessment information

Locating assessment resources

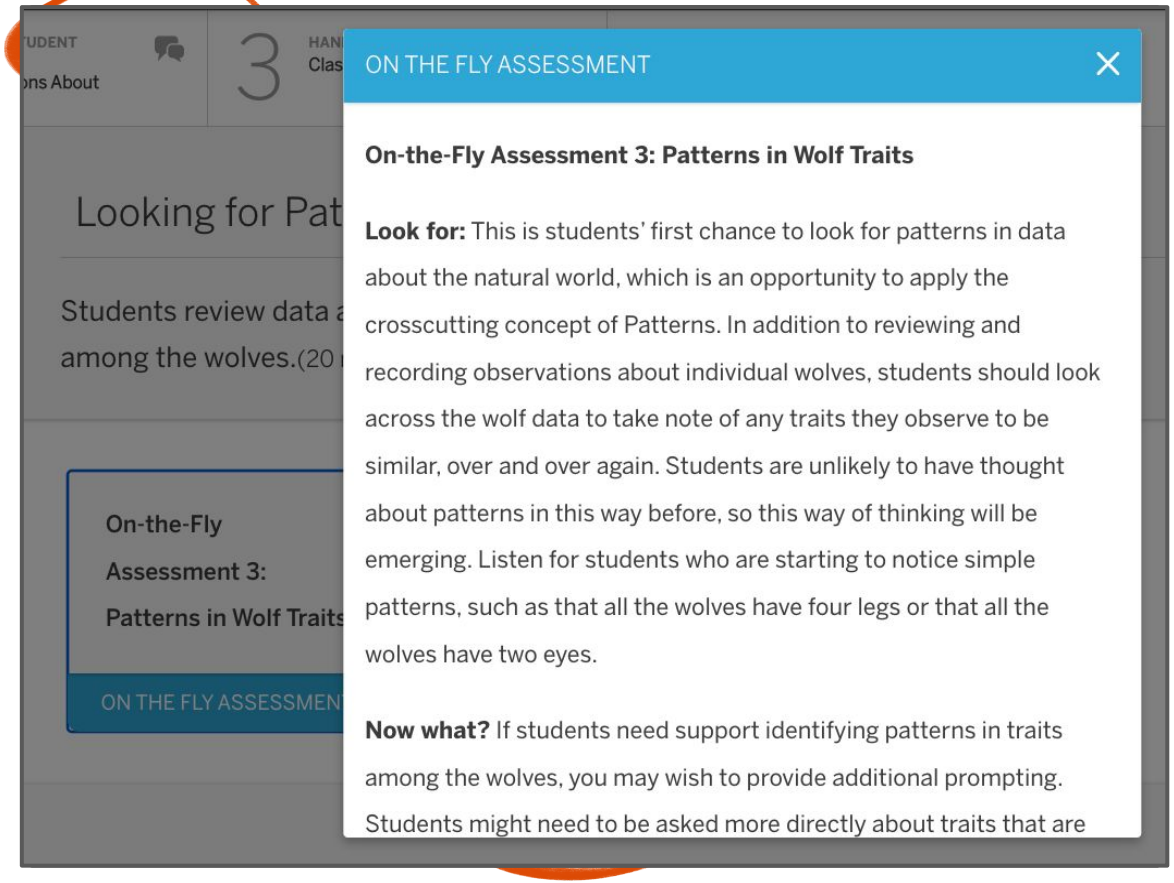
Full text of assessment

- Embedded Formative Assessments document
- Instructional guide
- Classroom Slides notes



On The Fly Assessment

Lesson 1.5



Embedded Formative Assessment

On-the-Fly, Lesson 1.5, Activity 1

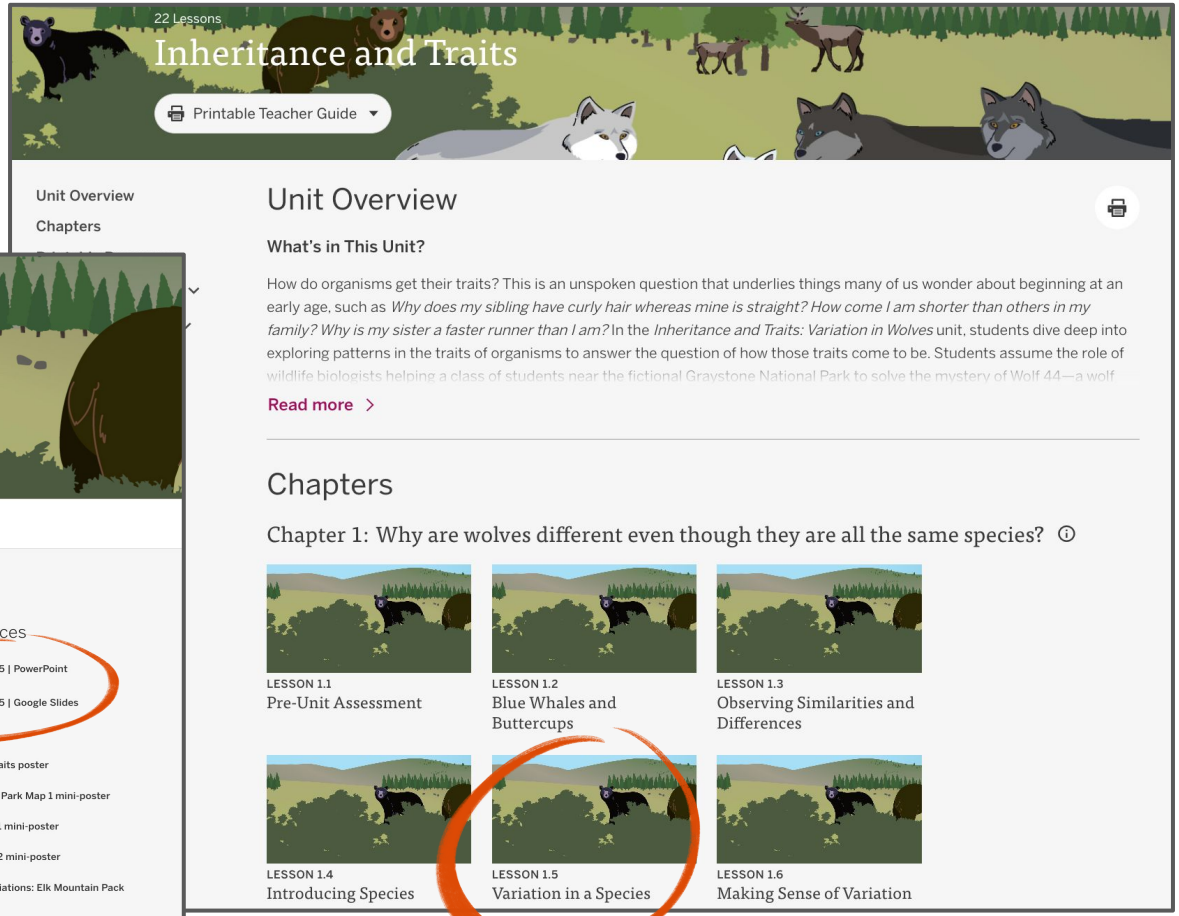
On-the-Fly Assessment 3: Patterns in Wolf Traits

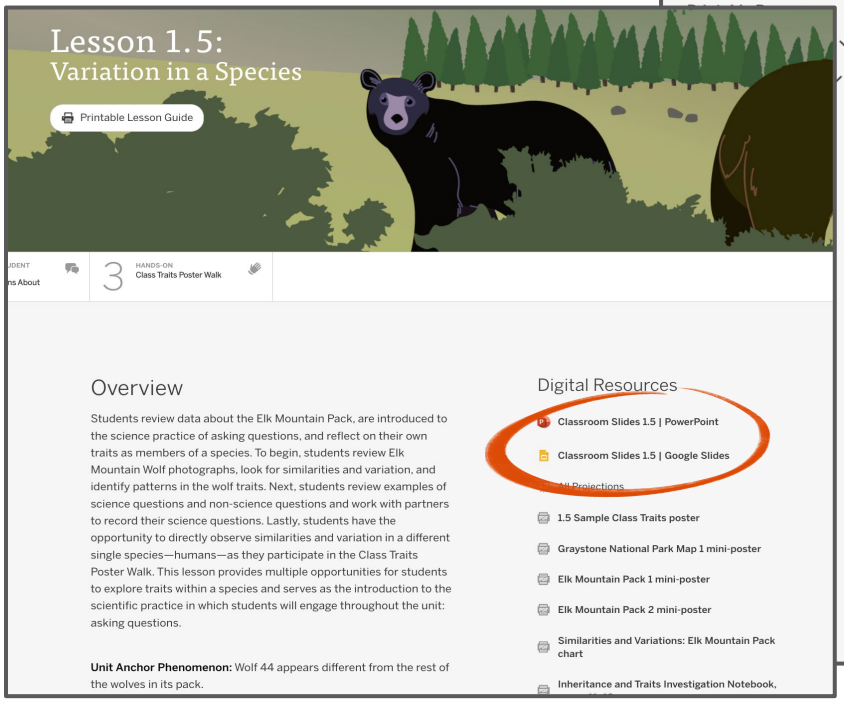
Look for: This is students' first chance to look for patterns in data about the natural world, which is an opportunity to apply the crosscutting concept of Patterns. In addition to reviewing and recording observations about individual wolves, students should look across the wolf data to take note of any traits they observe to be similar, over and over again. Students are unlikely to have thought about patterns in this way before, so this way of thinking will be emerging. Listen for students who are starting to notice simple patterns, such as that all the wolves have four legs or that all the wolves have two eyes.

Now what? If students need support identifying patterns in traits among the wolves, you may wish to provide additional prompting. Students might need to be asked more directly about traits that are the same across multiple wolves. If, after prompting, students still have trouble identifying patterns of similarity between the wolves, you may wish to review the data as a class. As you review the data, think aloud about what you observe about each wolf. Call on students to identify the similarities you noticed. Point out that these are patterns. Students will have many other opportunities to look for and discuss patterns throughout the unit, so it is not necessary that they reach a full understanding of the concept at this point in the unit.

Classroom slides

Lesson 1.5, Activity 1





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?

_____

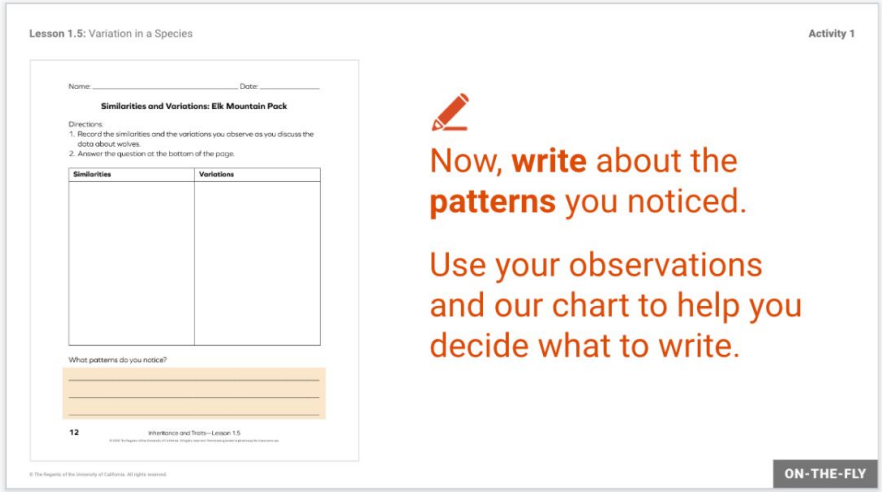
_____

_____

Now, **write** about the **patterns** you noticed.

Use your observations and our chart to help you decide what to write.

ON-THE-FLY



👉**Teacher action:**
Circulate as students work and take note of students who could benefit from additional instruction.

On-the-Fly Assessment 3:
Patterns in Wolf Traits
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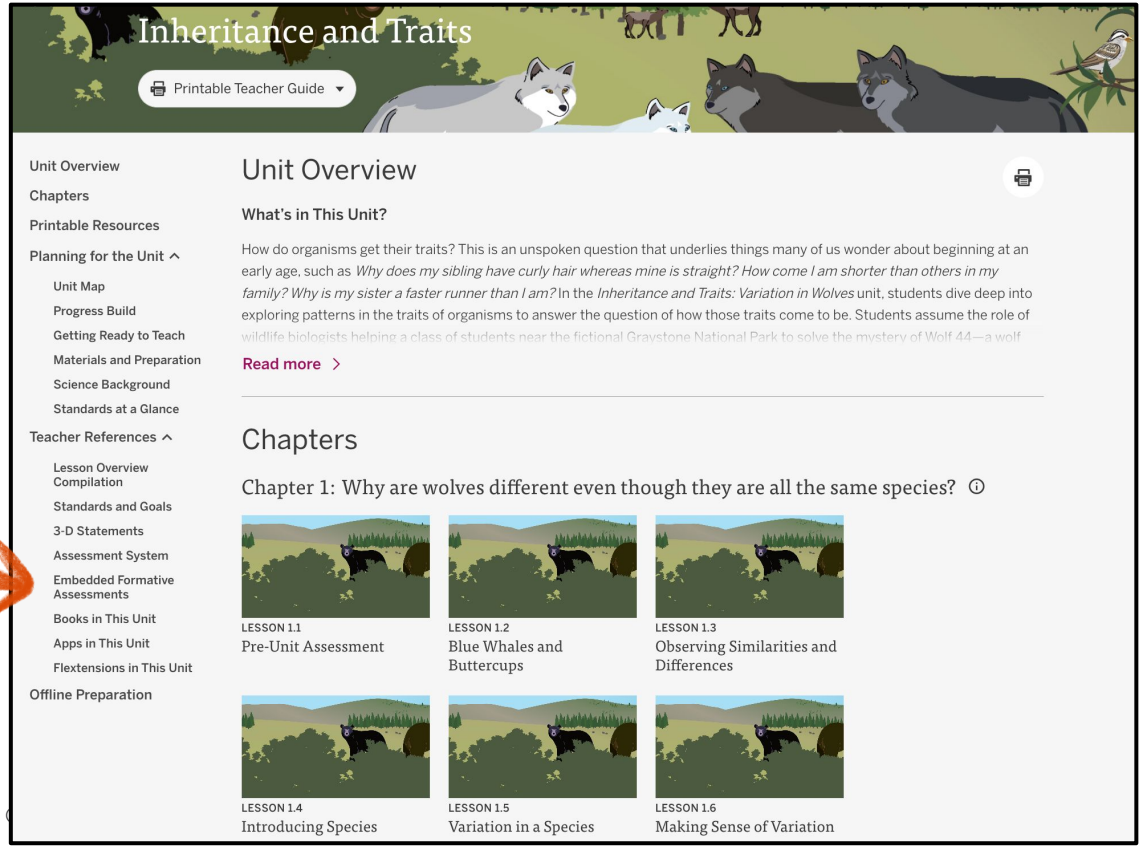
On the Fly Assessment

Work time

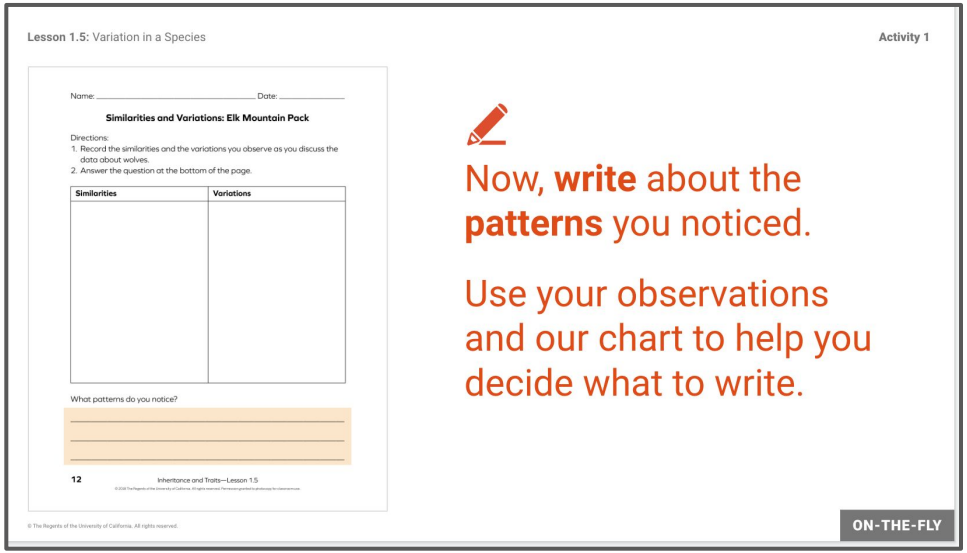
- Explore the On-the- Fly Assessments



Example assessment (On-the-Fly, Lesson 1.5, Activity 1)

Reflection

- What **data** can a teacher collect from this activity?
- What can a teacher **do** with this information?



Formative Assessment Resource

On-the-Fly Assessment 3: Patterns in Wolf Traits

Look for: This is students' first chance to look for patterns in data about the natural world, which is an opportunity to apply the crosscutting concept of Patterns. In addition to reviewing and recording observations about individual wolves, students should look across the wolf dat[illegible]ke note of any traits they observe to be similar, over and over again. Students are unlikely to have thought about pat[illegible] way before, so this way of thinking will be emerging. Listen for students who are starting to notice simple patterns, such as that all the wolves have four legs or that all the wolves have two eyes.

Look for 1

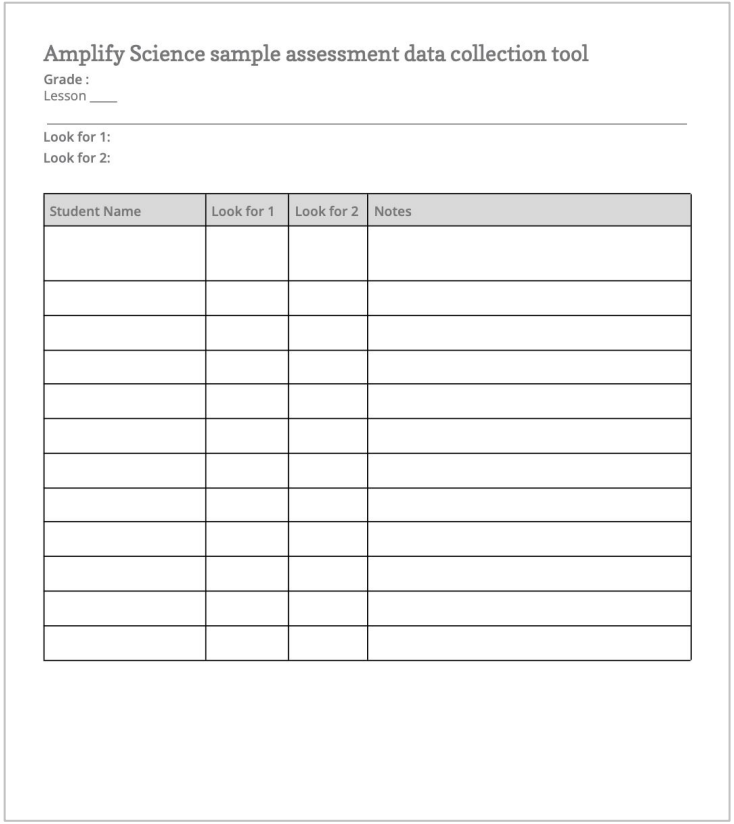
Now what? If students need support identifying patterns in traits among the wolves, you may wish to provide additional prompting. Students might need to be asked more directly about traits that are the same across multiple wolves. If, after prompting, students still have trouble identifying patterns of similarity between the wolves, you may wish to review the data as a class. As you review the data, think aloud about what you observe about each wolf. Call on students to identify the similarities you noticed. Point out that these are patterns. Students will have many other opportunities to look for and discuss patterns throughout the unit, so it is not necessary that they reach a full understanding of the concept at this point in the unit.

Classroom connection

Collecting formative assessment data

Plan ahead for what you're looking and listening for.

Create a system that's easy for you to use.



Amplify Science sample assessment data collection tool

Grade :
Lesson ____

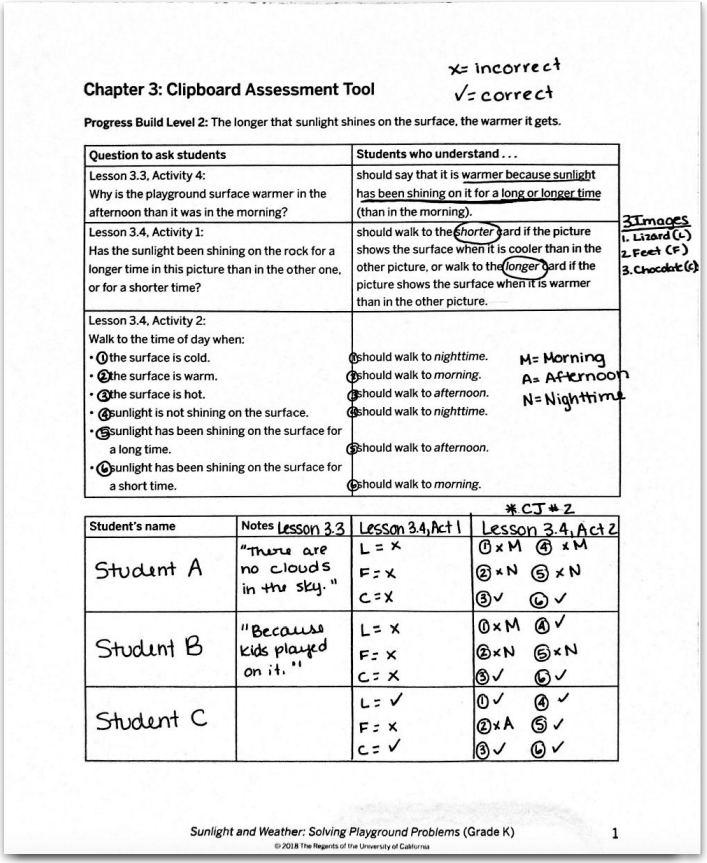
Look for 1:
Look for 2:

Student Name	Look for 1	Look for 2	Notes

K-1 Clipboard Assessment Tool

The Clipboard Assessment Tool offers a support for collecting data for the On-the-Fly and Critical Juncture Assessments that align to each Progress Build level in the unit.

Pgs. 14-15



x= incorrect
✓= correct

Chapter 3: Clipboard Assessment Tool

Progress Build Level 2: The longer that sunlight shines on the surface, the warmer it gets.

Question to ask students	Students who understand . . .
Lesson 3.3, Activity 4: Why is the playground surface warmer in the afternoon than it was in the morning?	should say that it is warmer because sunlight has been shining on it for a long or longer time (than in the morning).
Lesson 3.4, Activity 1: Has the sunlight been shining on the rock for a longer time in this picture than in the other one, or for a shorter time?	should walk to the *shorter* card if the picture shows the surface when it is cooler than in the other picture, or walk to the *longer* card if the picture shows the surface when it is warmer than in the other picture.
Lesson 3.4, Activity 2: Walk to the time of day when: • ① the surface is cold. • ② the surface is warm. • ③ the surface is hot. • ④ sunlight is not shining on the surface. • ⑤ sunlight has been shining on the surface for a long time. • ⑥ sunlight has been shining on the surface for a short time.	① should walk to *nighttime*. ② should walk to *morning*. ③ should walk to *afternoon*. ④ should walk to *nighttime*. ⑤ should walk to *afternoon*. ⑥ should walk to *morning*.

3 Images
1. Lizard (L)
2. Feet (F)
3. Chocolate (C)

M= Morning
A= Afternoon
N= Nighttime

* CJ # 2

Student's name	Notes Lesson 3.3	Lesson 3.4, Act 1	Lesson 3.4, Act 2
Student A	"There are no clouds in the sky."	L = x F = x C = x	① x M ④ x M ② x N ⑤ x N ③ ✓ ⑥ ✓
Student B	"Because kids played on it."	L = x F = x C = x	① x M ④ ✓ ② x N ⑤ x N ③ ✓ ⑥ ✓
Student C		L = ✓ F = x C = ✓	① ✓ ④ ✓ ② x A ⑤ ✓ ③ ✓ ⑥ ✓

Additional formative assessment information

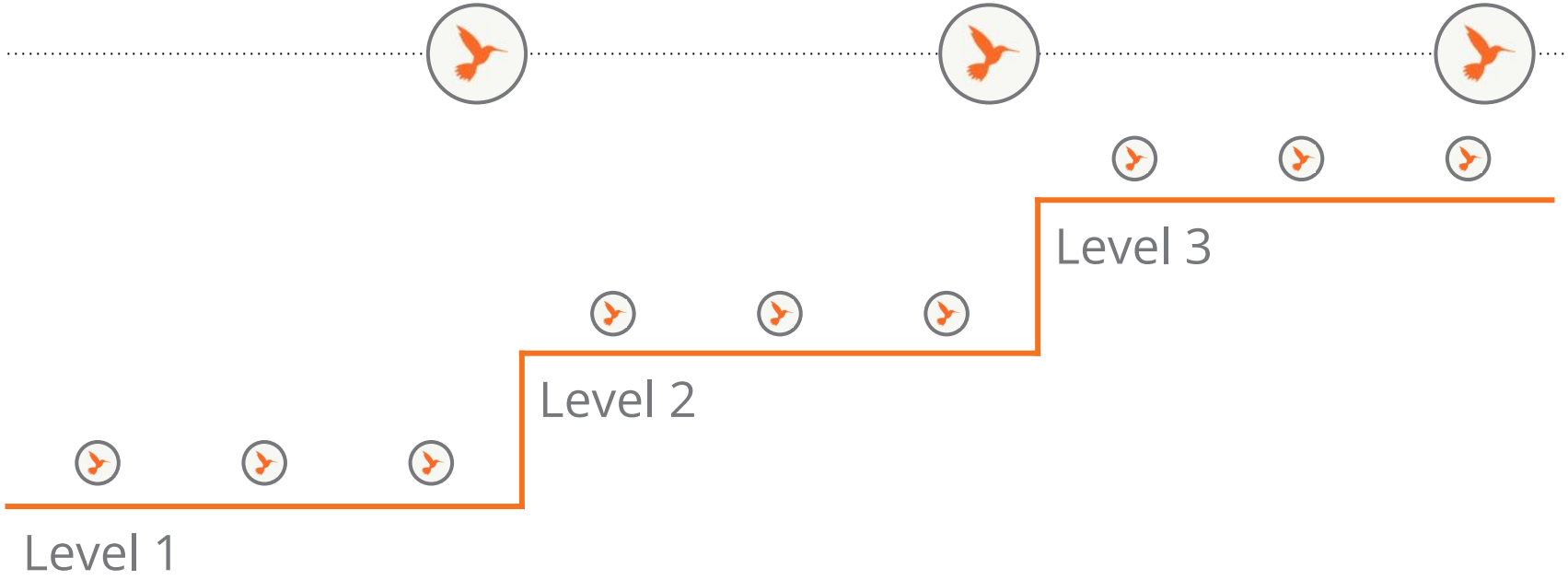
On-the-Fly Assessments

In addition to assessing concepts in the Progress Build, some On-the-Fly Assessments provide data about:

- Science and Engineering Practices
- Crosscutting Concepts
- Literacy skills
- Student collaboration

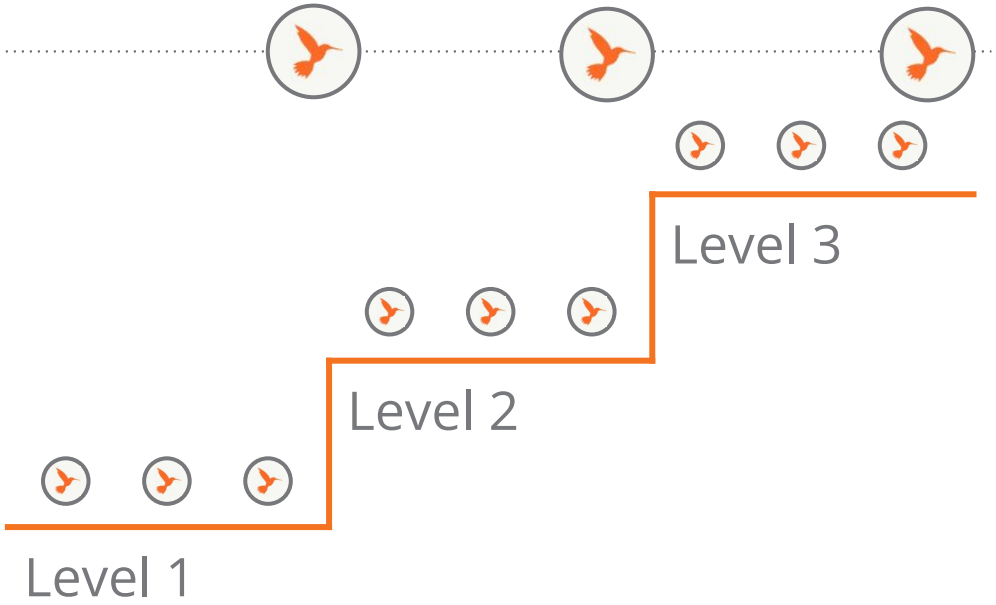
Questions?

Critical Juncture Assessments

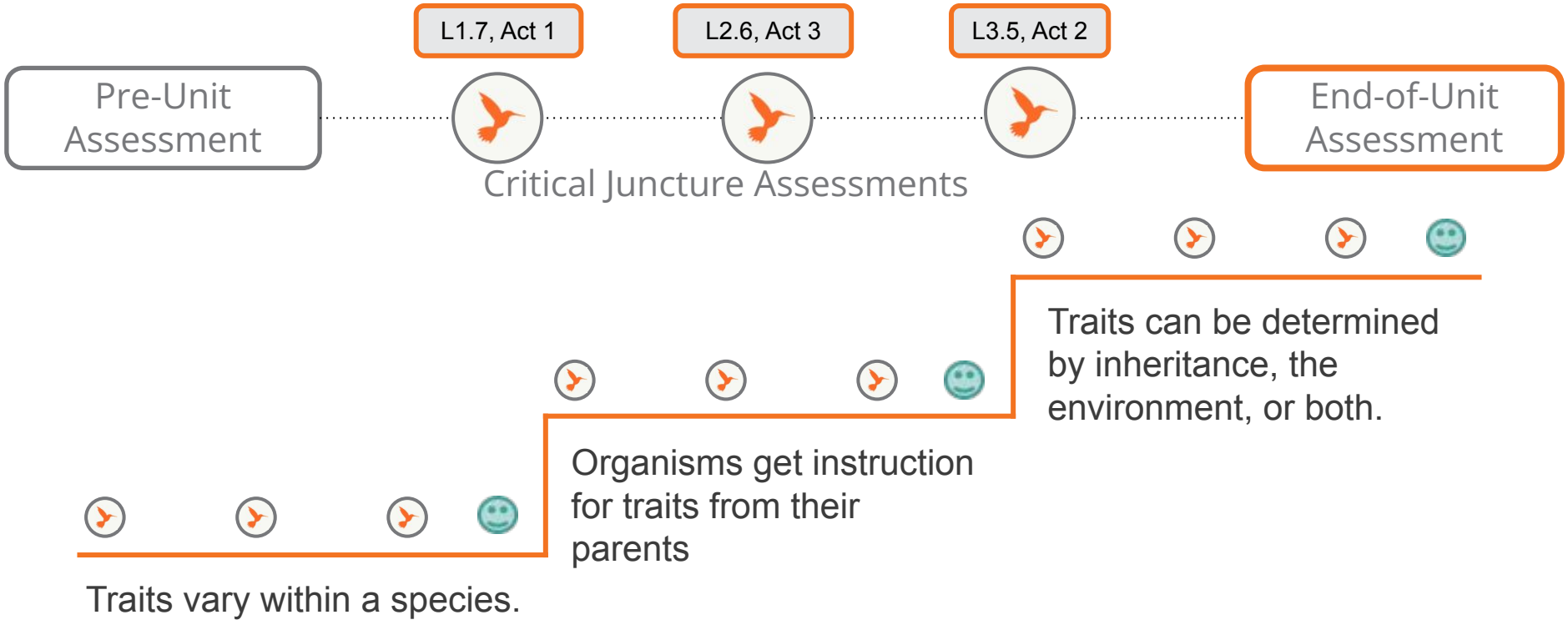


Critical Juncture Assessments

- Track student progress between Progress Build levels
- Embedded into instruction
- Assessment resource includes “Assess Understanding” and “Tailor Instruction”

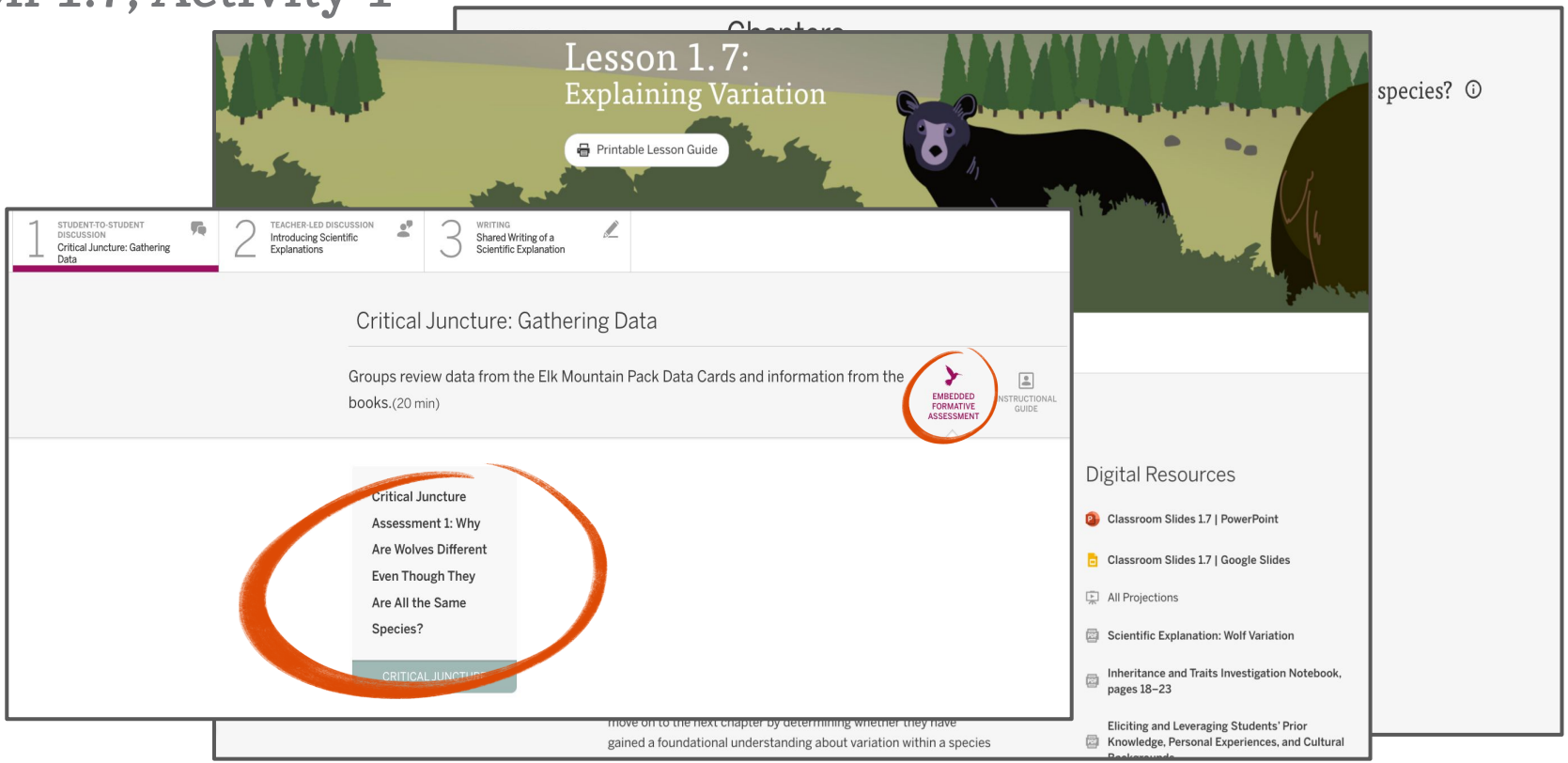


K-5 Assessment System



Critical Juncture Assessment

Lesson 1.7, Activity 1



Embedded Formative Assessment

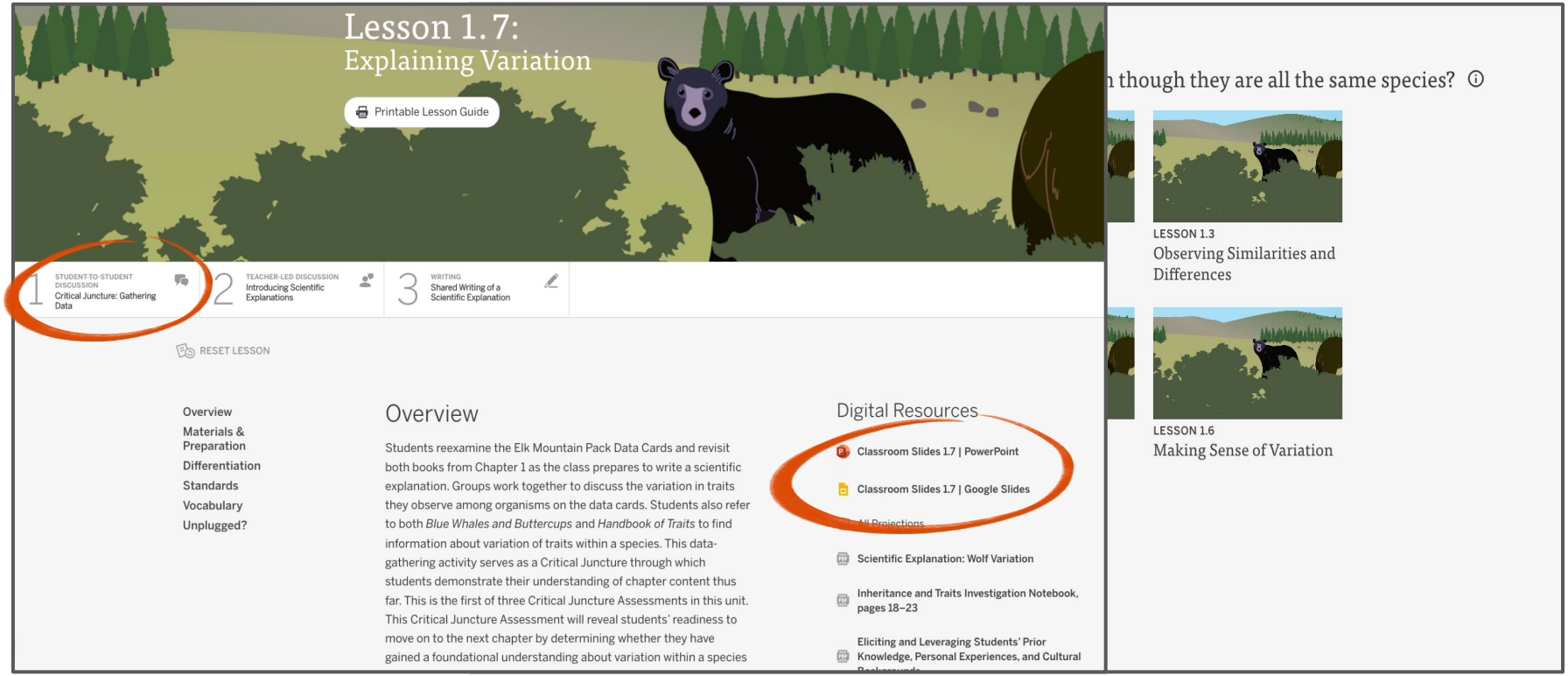
Critical Juncture Lesson 1.7, Activity 1

Assess understanding: The purpose of this Critical Juncture is to assess students' understanding that traits of organisms vary within a species. It is important that students understand this idea to position themselves for success in the lessons that follow, which will build on this idea. At this point in the unit, students should be able to construct a short written response to answer the Chapter 1 Question: *Why are wolves different even though they are all the same species?* with a response that demonstrates understanding of variation of traits within the same species. As you circulate, pay attention to how students are answering the question. Are they using information in their responses that they recorded on page 21, Gathering Information About Wolves, in their notebooks? Did they include science words in their responses? Although students are completing Parts 1–3 of the graphic organizer (on page 21) with their group members, make sure that students answer the question on page 22, Reflecting on Why Wolves Are Different, in their notebooks independently so you can assess each student individually.

Tailor instruction: If students do not demonstrate understanding that organisms have traits and that traits can vary within a species, have students read the first three paragraphs on page 4 of *Handbook of Traits*. Referring to the last sentence in the second paragraph that compares a tomato plant to a giraffe, ask students to turn to the specific pages in the book to describe the traits they observe in both the tomato plant and the giraffe (pages 40–41 and 16–17, respectively). Then, ask students to read page 17, which focuses on variations in the giraffe species. Have students connect these ideas of traits and variation back to the context of the wolves.

Critical Juncture Assessment

Lesson 1.7, Activity 1



Name: _____ Date: _____

Reflecting on Why Wolves Are Different

Directions:
1. Read the question below.
2. Based on the information you gathered with your group, write your ideas about the answer to the question.

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

_____

_____

_____

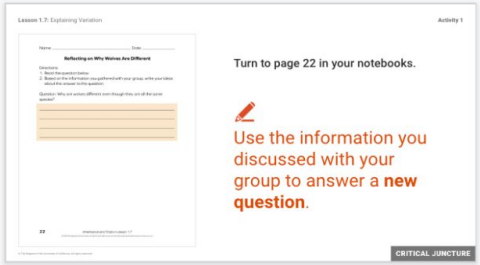
_____

22

Inheritance and Traits—Lesson 1.7

Turn to page 22 in your notebooks.

Use the information you discussed with your group to answer a **new question**.



👉**Teacher action:**
Read the directions and the question on page 22 of the notebook out loud. Circulate as students work, helping as necessary.

💬 **Suggested teacher talk:**
Work independently as you write.

👉**Teacher action:**
When students finish, have them clip together their card sets. Then collect card sets and books.

Critical Juncture Assessment 1:
Why Are Wolves Different Even Though They Are All the Same Species?
Assess understanding: The purpose of this Critical Juncture is to assess students' understanding that traits of organisms vary within a species. It is important that students understand this idea to position themselves for success in the lessons that follow, which will build on this idea. At this point in the unit, students should be able to construct a short written response to answer the Chapter 1 Question: *Why are wolves different even though they are all the same species?* with a response that demonstrates understanding of variation of traits within the same species. As you circulate, pay attention to how students are answering the question. Are they using information in their responses that they recorded on page 21, Gathering Information About Wolves, in their notebooks? Did they include science words in their responses? Although students are completing Parts 1–3 of the graphic organizer (on page 21) with their group members, make sure that students answer the question on page 22, Reflecting on Why Wolves Are Different, in their notebooks independently so you can assess each student individually.
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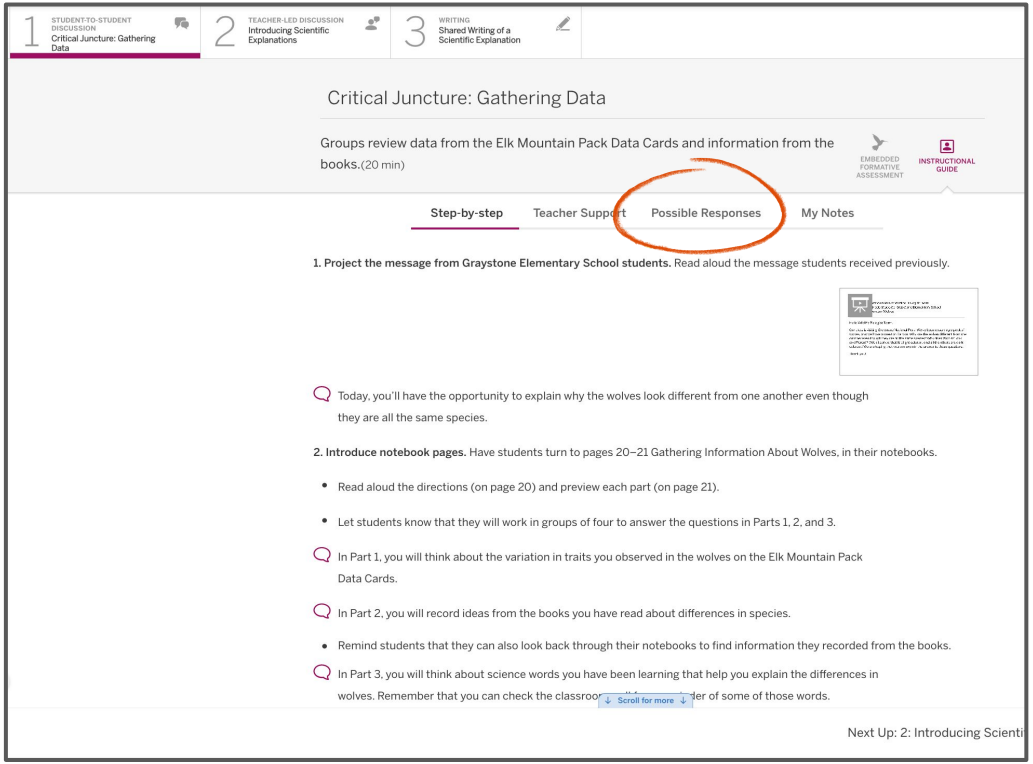
Formative assessment information

Possible student responses

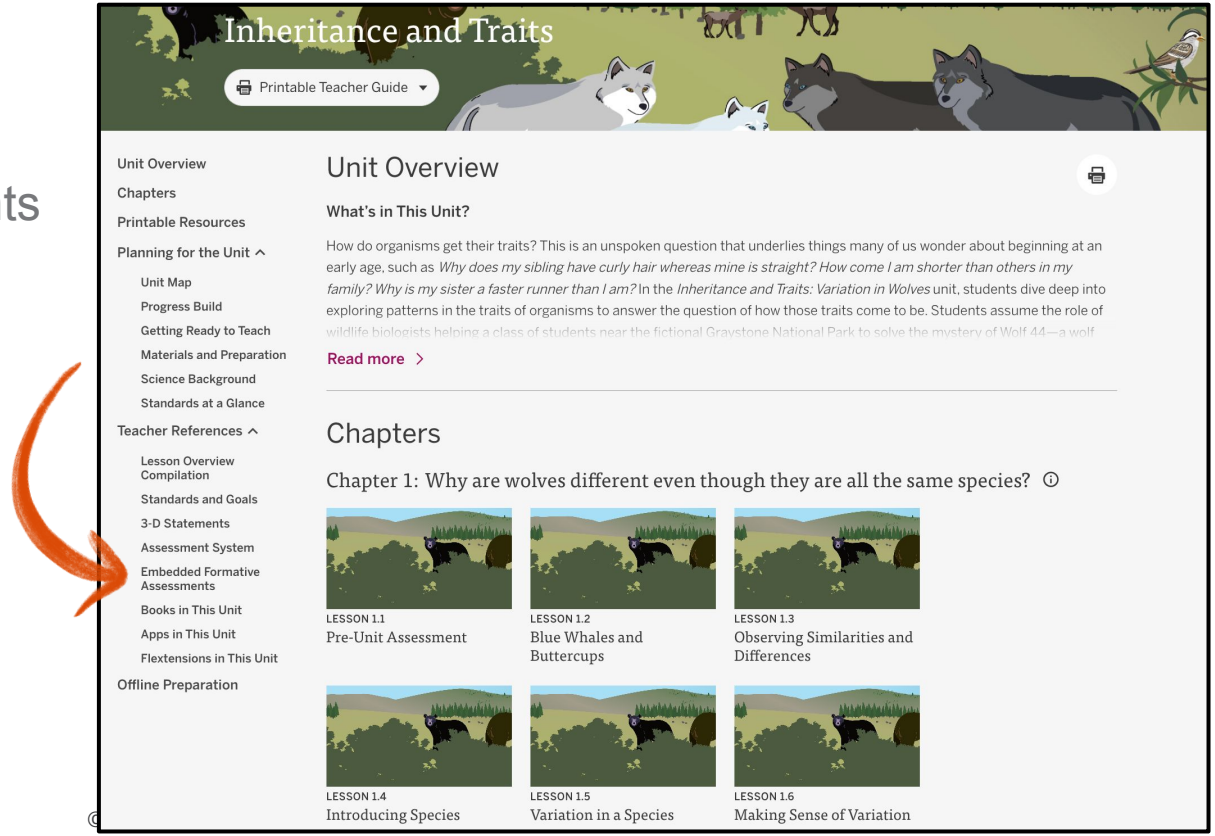
- Within assessments:
  - “Look fors” (OtF)
  - “Assess Understanding” (CJ)
- Possible responses within the Instructional Guide
- Digital resources
  - Assessment Guides
  - Teacher References



Formative Assessments

Work time

- Explore the Critical Juncture Assessments

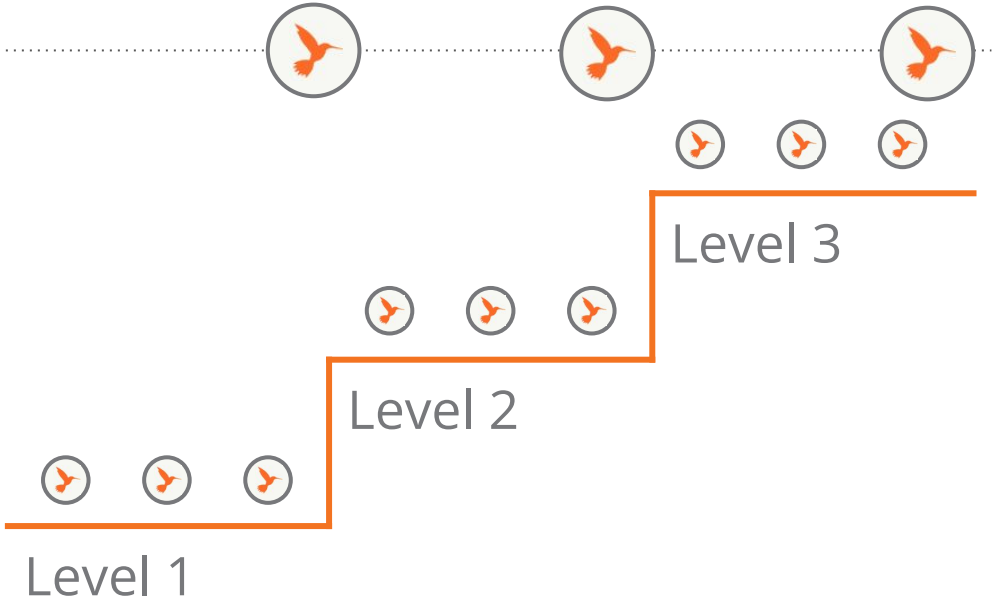


Embedded formative assessments

Reflection

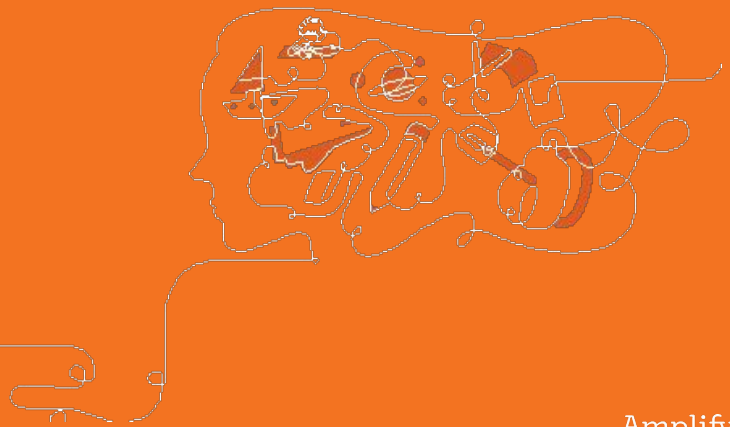
In 1-2 sentences, describe the relationship among:

- Progress Build
- On-the-Fly Assessments
- Critical Juncture Assessments

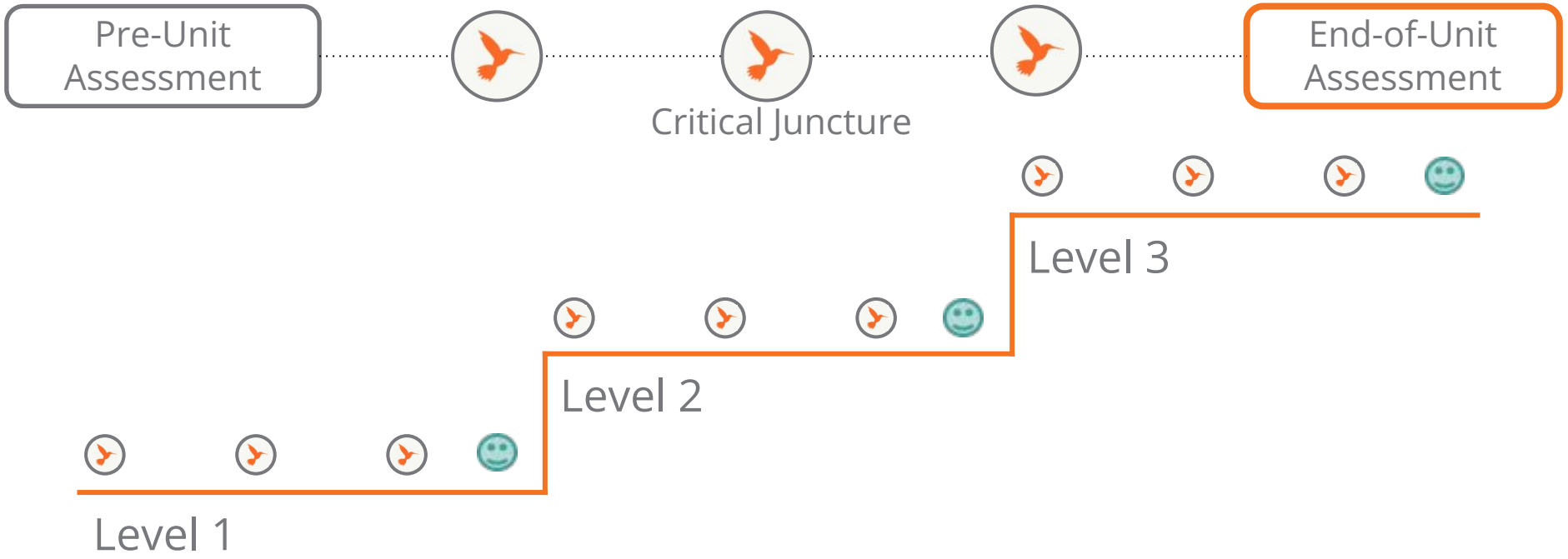


Questions?

End-of-Unit Assessment



K-5 Assessment System



End-of-Unit Assessment

3-dimensional assessment opportunity

- Summative assessment of mastery of science concepts
- Formative assessment of Science and Engineering Practices

End of Unit Assessments

What are students being asked to do?

1. Write a scientific explanation that answers the question "What makes Wolf 44 medium size?"

2. Your audience is the students at Graystone Elementary School.

3 Dimensional Learning

Science and Engineering Practices

- Practice 6: Constructing Explanations and Designing Solutions
  - CEDS-E1: Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).
- Practice 8: Obtaining, Evaluating, and Communicating Information
  - INFO-E5: Communicate scientific and/or technical information orally and/or in written formats, including various forms of media and may include tables, diagrams, and charts.

Disciplinary Core Ideas

- LS3.A: Inheritance of Traits:
  - LS3.A-E1: Many characteristics of organisms are inherited from their parents. (3-LS3-1)
  - LS3.A-E2: Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)
- LS3.B: Variation of Traits:
  - LS3.B-E1: Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)
  - LS3.B-E2: The environment also affects the traits that an organism develops. (3-LS3-2)

Crosscutting Concept

- Patterns
  - PAT-E1: Similarities and differences in patterns can be used to sort, classify, communicate and analyze ... natural phenomena ...

End of Unit Assessment Rubric

Pgs. 11-14

Question: What makes Wolf 44 medium size?

Rubric 1: Assessing Students' Performance of the Practices Obtaining, Evaluating, and Communicating Information
Rubric 1 focuses on the first two criteria (causal and explanato designed to monitor and support students as they develop dex explanations. For each criterion, levels are described to monito the degree to which students can independently demonstrate Importantly, practices develop through regular opportunities f and mastery of the practice is outside the scope of a single uni formative feedback to students rather than assign summative a teacher may use to assess a student's written work and prov encounters with the practice.

Rubric 1: Assessing Students' Performance of the Practic Obtaining, Evaluating, and Communic	
Criteria	**Description of level**
Causal and explanatory Does the explanation go beyond, or add to, what can be observed to explain the size of Wolf 44?	The writing does not go beyond, or add to, *why* Wolf 44 is medium size. Possible feedback: *You described Wolf 44 a bigger than Y, but why is Wolf 44 medium si of an organism?*
	The writing goes beyond describing that W to the two packs to propose: • why it is smaller than the wolves in the OR • why it is bigger than the wolves in the B Possible feedback: *You gave a partial explar is influenced by the size of its parents), but c Wolf 44 is medium size (e.g., why Wolf 44 is*
	The writing goes beyond describing that W to the two packs to propose: • why it is smaller than the wolves in the AND • why it is bigger than the wolves in the B Possible feedback: *Is there anything else th understand why Wolf 44 is the size that it is?*

Rubric 1: Assessing Students' Performance of the Practic Obtaining, Evaluating, and Communica	
Criteria	**Description of level**
Communicates information clearly Is the explanation written in a way that will allow the audience to understand it?	Questions to guide review of student's writ In assigning a level for this criterion, take in supports and expectations emphasized in y a score from 0–2, but you may adjust the s instructional priorities. Note that not all que for your classroom, and/or you may choos • Does the explanation begin with a topic summarizes the explanation and answe • If you ask, can the student describe ho explanation appropriate to the audienc Elementary School)? • Is the explanation logically organized in • Does the explanation use appropriate s unit (e.g., *environment, inherit, instructi*

Rubric 2: Assessing Students' Understanding of Science Ide
Rubric 2 considers whether students' explanations are consist students have encountered in the unit. This rubric may be use each science idea demonstrated, as described below.

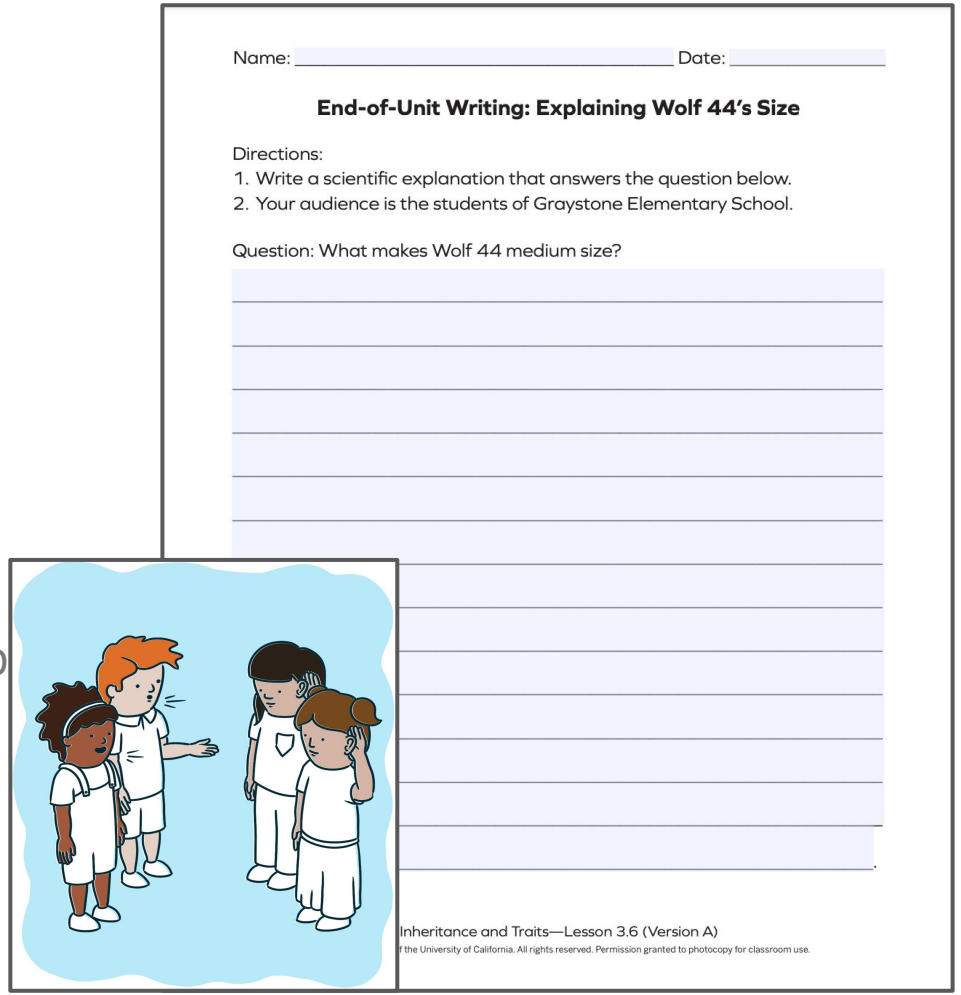
Rubric 2: Assessing Students' Understanding of the Science Ideas Encountered in the Unit		
Criteria	**Questions to keep in mind**	**Score**
Grounded in evidence Is the explanation *consistent* with the relevant science ideas that students have experienced so far? (Note that students need not explicitly cite classroom examples or data, as long as their descriptions are consistent with the science ideas learned.)	Does the student show understanding that traits can be determined by both inheritance and environment? (1 point) Evidence could include: • The explanation describes Wolf 44 as being medium size both because of its parents and because of something in its environment (e.g., food).	
	Does the student show understanding of how traits are influenced by inheritance? (1 point) Evidence could include: • The explanation describes Wolf 44 as being smaller than the wolves in the Elk Mountain Pack due to inheriting instructions for the trait of being small from its small parents in the Bison Valley Pack.	
	Does the student show understanding that traits are influenced by the environment? (1 point) Evidence could include: • The explanation describes Wolf 44 as being larger than the wolves in the Bison Valley Pack because in its environment with the wolves of the Elk Mountain Pack there is more food, so Wolf 44 can grow larger.	
	Total (0–3)	

Rubric 3: Assessing Students' Understanding of the Crosscutting Concept of Patterns
Rubric 3 considers how well students are able to apply the crosscutting concept of Patterns to a specific phenomenon. This rubric may be used summatively by tallying the points for each application demonstrated, as described below.

End-of-Unit Assessment

Work time

- Open your Participant Notebook to page 14
- Score the three student responses with rubric 2 only (science ideas).
- Come together with your group and discuss your scores.
- Share out



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.

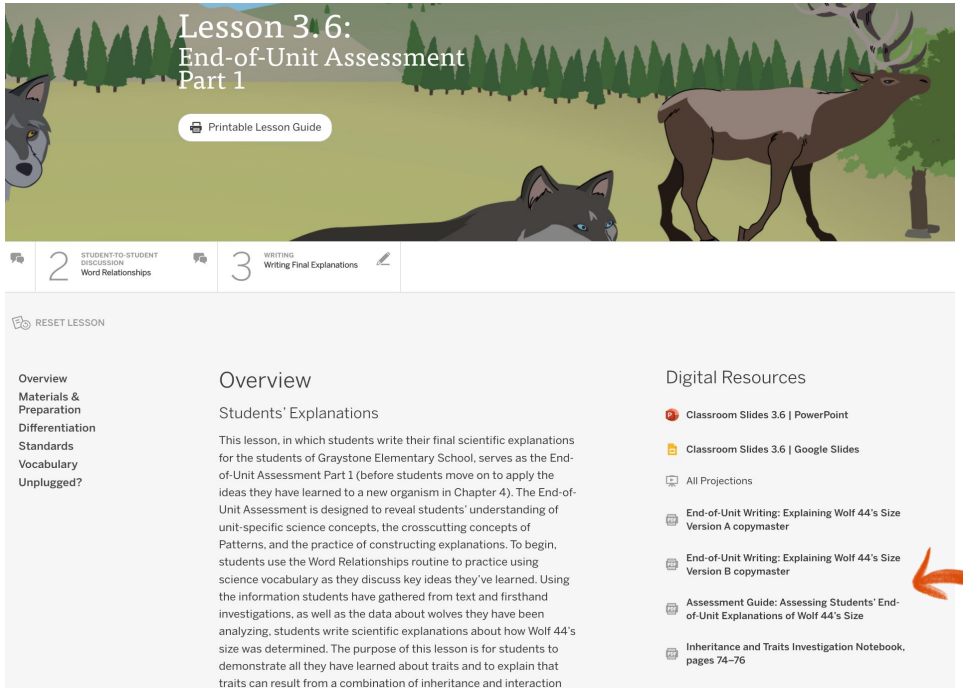
Question: What makes Wolf 44 medium size?

Inheritance and Traits—Lesson 3.6 (Version A)

End-of-Unit Assessment

Inheritance and Traits

- Go to the The **End-of-Unit Writing** and the **End-of Unit Assessment Guide** on the lesson page
- Compare your scores with the student responses in the guide.
- Discuss with your group if there were any differences.

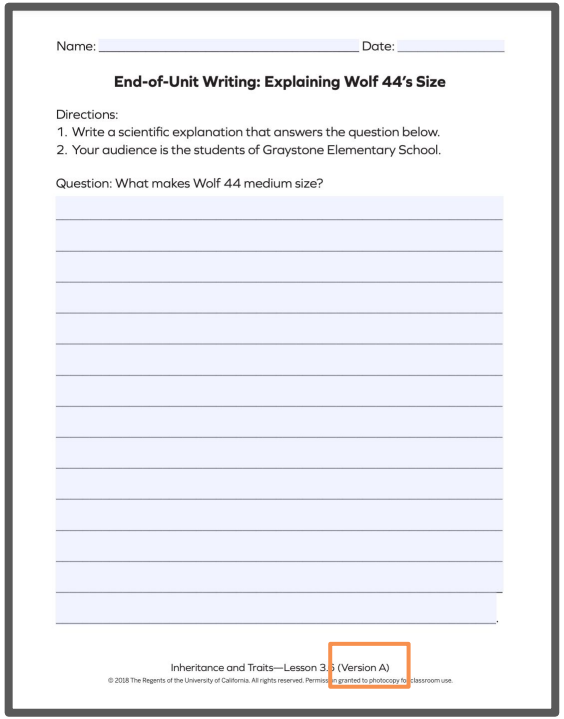


End-of-Unit Assessment

Form A and B

Digital Resources

- Classroom Slides 3.6 | PowerPoint
- Classroom Slides 3.6 | Google Slides
- All Projections
- End-of-Unit Writing: Explaining Wolf 44's Size Version A copymaster
- End-of-Unit Writing: Explaining Wolf 44's Size Version B copymaster
- Assessment Guide: Assessing Students' End-of-Unit Explanations of Wolf 44's Size
- Inheritance and Traits Investigation Notebook, pages 74–76



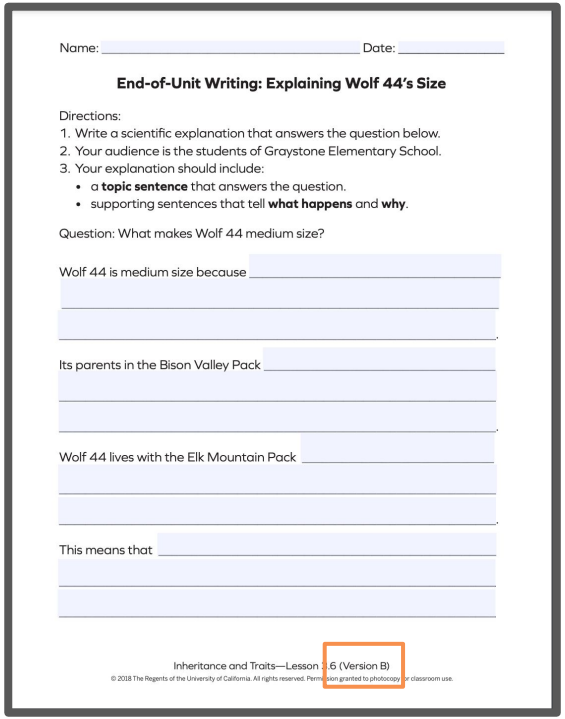
Name: _____ Date: _____

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?

Inheritance and Traits—Lesson 3.6 (Version A)



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.
3. Your explanation should include:
   - a **topic sentence** that answers the question.
   - supporting sentences that tell **what happens** and **why**.

Question: What makes Wolf 44 medium size?

Wolf 44 is medium size because _____

Its parents in the Bison Valley Pack _____

Wolf 44 lives with the Elk Mountain Pack _____

This means that _____

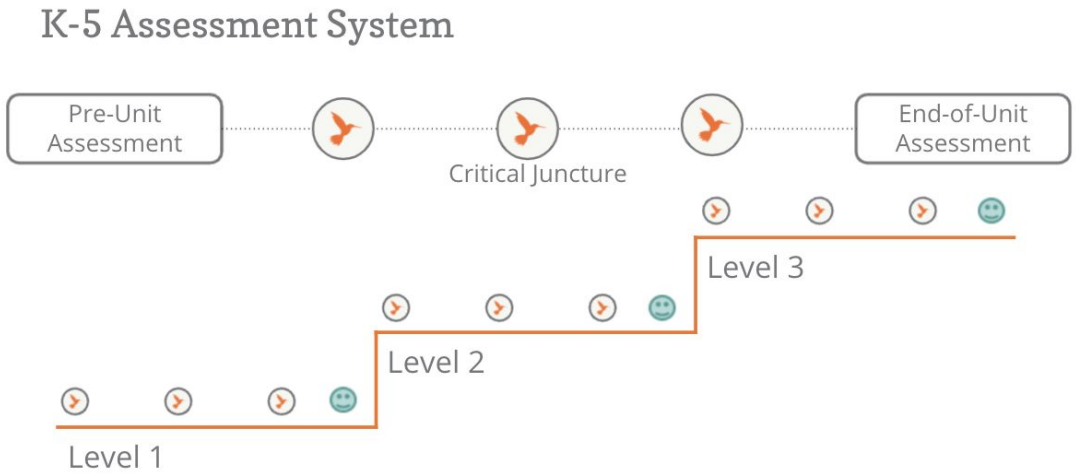
Inheritance and Traits—Lesson 3.6 (Version B)

Assessment System

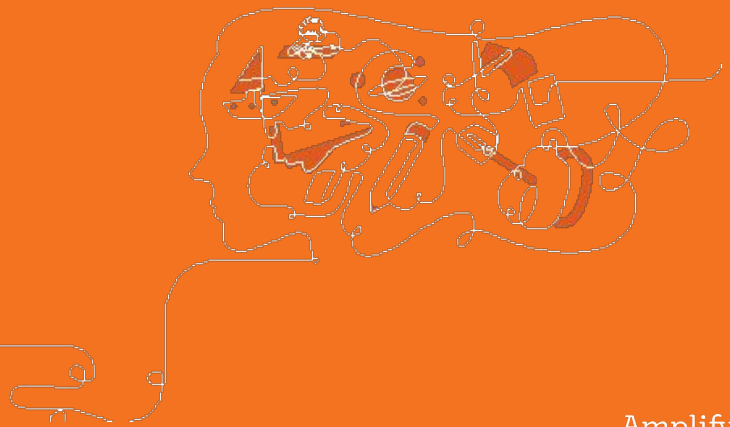
Reflection

How do the Progress Build and assessments work as a **system**?

What are the benefits of this system for students? For teachers?



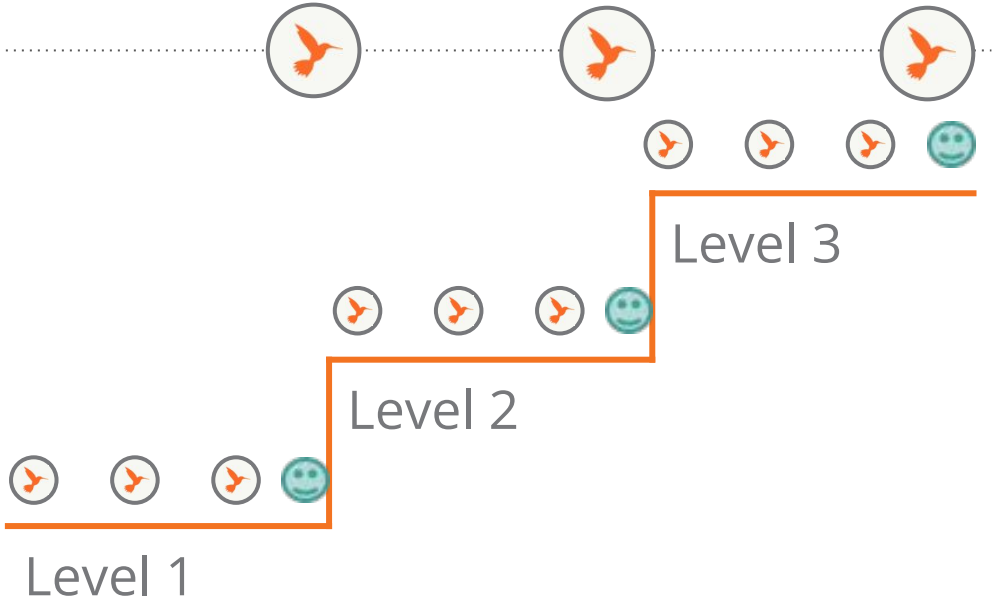
Lunch Break



Additional formative assessment information

Student Self-Assessments

- End of each chapter
- Grades K-1: Pair Share activity
- Grades 2-5: Independent Investigation Notebook activity



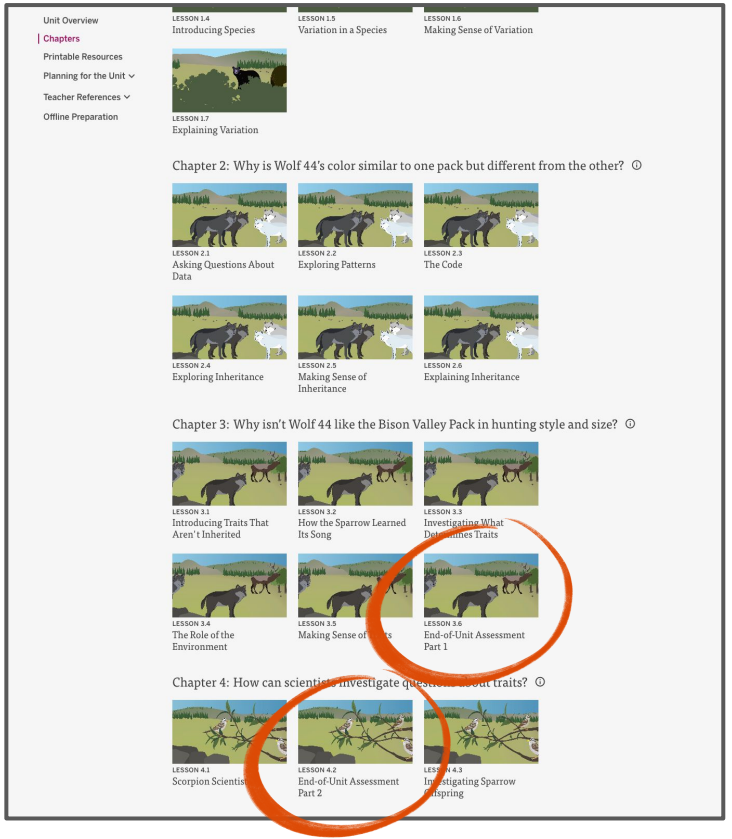
Additional assessment information

End of Unit Assessments

End of Unit Assessment Part 1

End of Unit Assessment Part 2

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

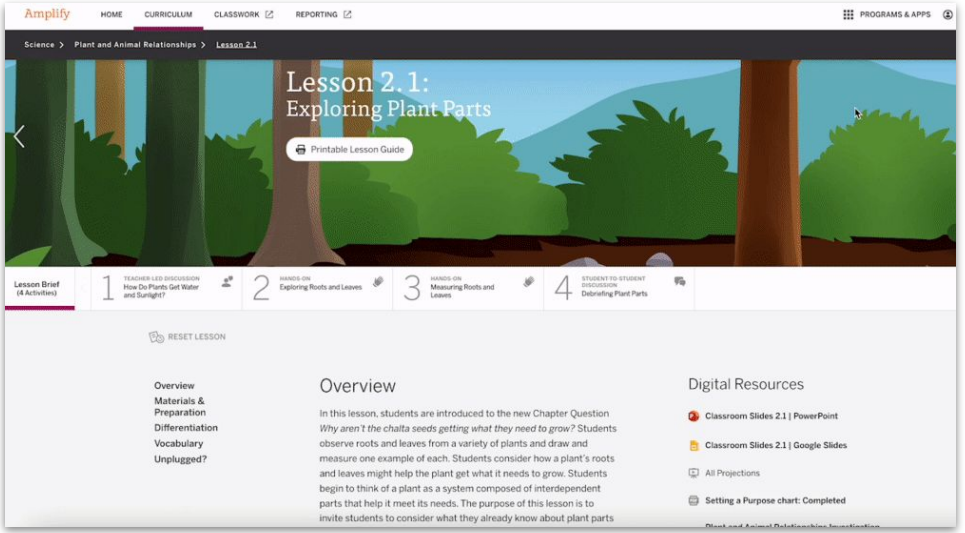


Questions?

Resources for NGSS progress monitoring

NGSS Benchmark assessments

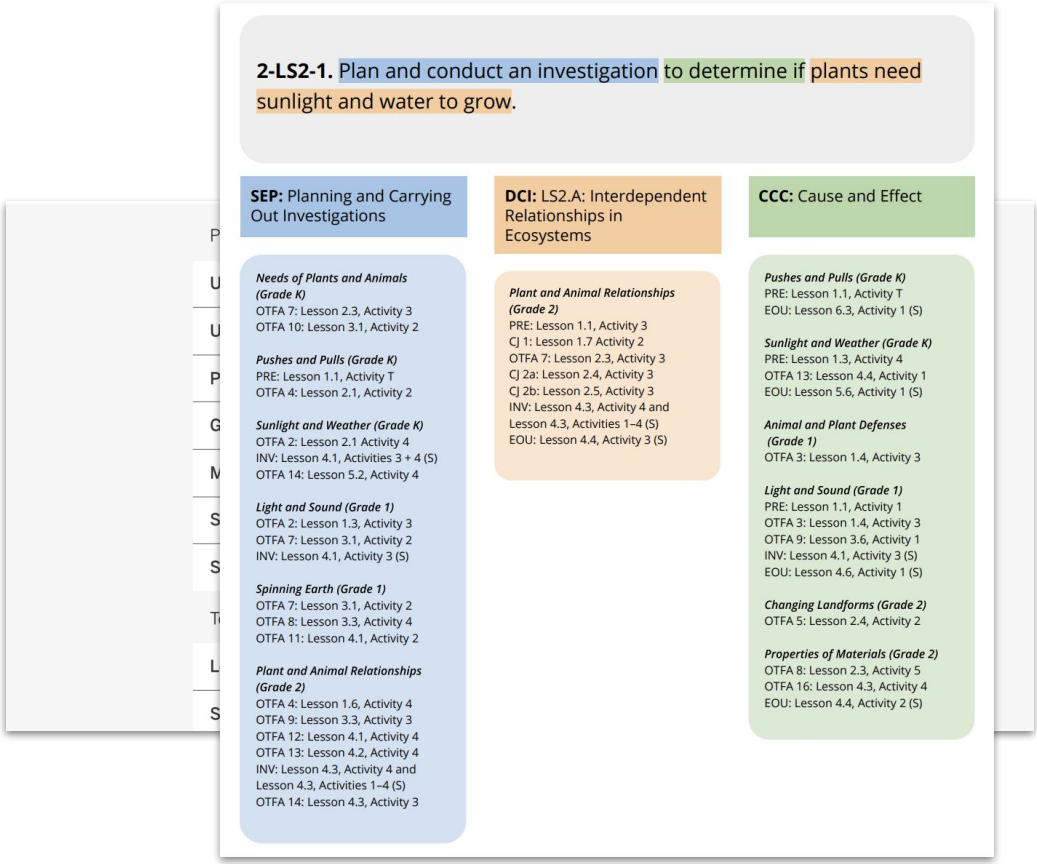
- Accessible in the Global Navigation menu
- Grades 3-5
- 4 assessments per grade



Resources for NGSS progress monitoring

3D Assessment Objectives

- Located in the Unit Guide
- Identifies where each dimension of the target Performance Expectations are assessed in the unit, in the grade, or in the grade-band.



2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

SEP: Planning and Carrying Out Investigations

Needs of Plants and Animals (Grade K)
OTFA 7: Lesson 2.3, Activity 3
OTFA 10: Lesson 3.1, Activity 2

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
OTFA 4: Lesson 2.1, Activity 2

Sunlight and Weather (Grade K)
OTFA 2: Lesson 2.1 Activity 4
INV: Lesson 4.1, Activities 3 + 4 (S)
OTFA 14: Lesson 5.2, Activity 4

Light and Sound (Grade 1)
OTFA 2: Lesson 1.3, Activity 3
OTFA 7: Lesson 3.1, Activity 2
INV: Lesson 4.1, Activity 3 (S)

Spinning Earth (Grade 1)
OTFA 7: Lesson 3.1, Activity 2
OTFA 8: Lesson 3.3, Activity 4
OTFA 11: Lesson 4.1, Activity 2

Plant and Animal Relationships (Grade 2)
OTFA 4: Lesson 1.6, Activity 4
OTFA 9: Lesson 3.3, Activity 3
OTFA 12: Lesson 4.1, Activity 4
OTFA 13: Lesson 4.2, Activity 4
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
OTFA 14: Lesson 4.3, Activity 3

DCI: LS2.A: Interdependent Relationships in Ecosystems

Plant and Animal Relationships (Grade 2)
PRE: Lesson 1.1, Activity 3
CJ 1: Lesson 1.7 Activity 2
OTFA 7: Lesson 2.3, Activity 3
CJ 2a: Lesson 2.4, Activity 3
CJ 2b: Lesson 2.5, Activity 3
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
EOU: Lesson 4.4, Activity 3 (S)

CCC: Cause and Effect

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
EOU: Lesson 6.3, Activity 1 (S)

Sunlight and Weather (Grade K)
PRE: Lesson 1.3, Activity 4
OTFA 13: Lesson 4.4, Activity 1
EOU: Lesson 5.6, Activity 1 (S)

Animal and Plant Defenses (Grade 1)
OTFA 3: Lesson 1.4, Activity 3

Light and Sound (Grade 1)
PRE: Lesson 1.1, Activity 1
OTFA 3: Lesson 1.4, Activity 3
OTFA 9: Lesson 3.6, Activity 1
INV: Lesson 4.1, Activity 3 (S)
EOU: Lesson 4.6, Activity 1 (S)

Changing Landforms (Grade 2)
OTFA 5: Lesson 2.4, Activity 2

Properties of Materials (Grade 2)
OTFA 8: Lesson 2.3, Activity 5
OTFA 16: Lesson 4.3, Activity 4
EOU: Lesson 4.4, Activity 2 (S)

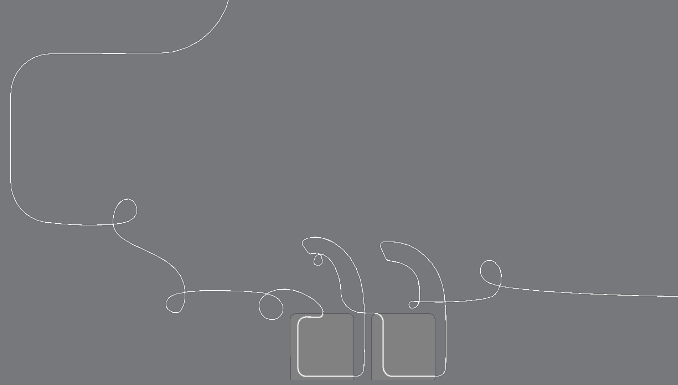
Generating grades

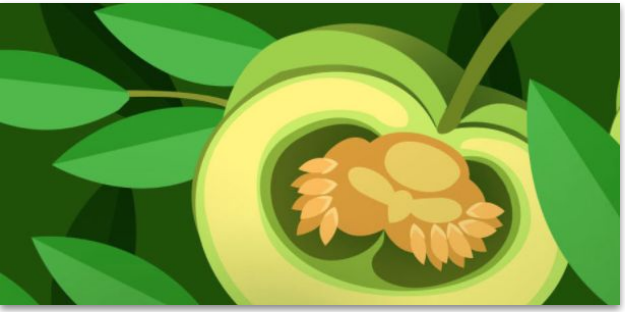
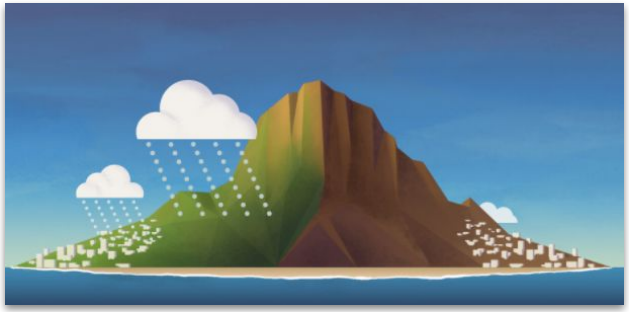
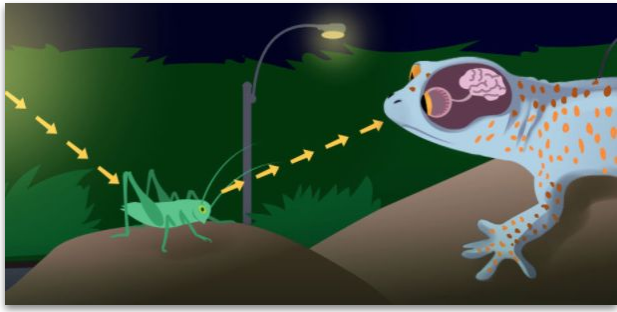
Group collaborative discussion

What are your district's grading requirements for science?

How will you use Amplify Science assessments to generate grades?

Questions?



Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Inheritance and Traits

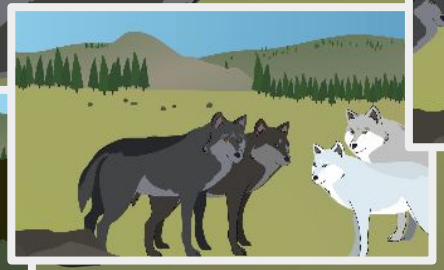
Problem: Why does Wolf 44 appear different from the rest of the wolves in its pack?

Role: Wildlife Biologists

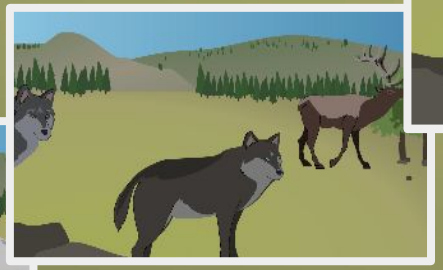
Students observe variation between and within different species, investigate inherited traits and those that result from the environment, and explain how Wolf 44 acquired certain traits.

Coherent Storylines

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



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

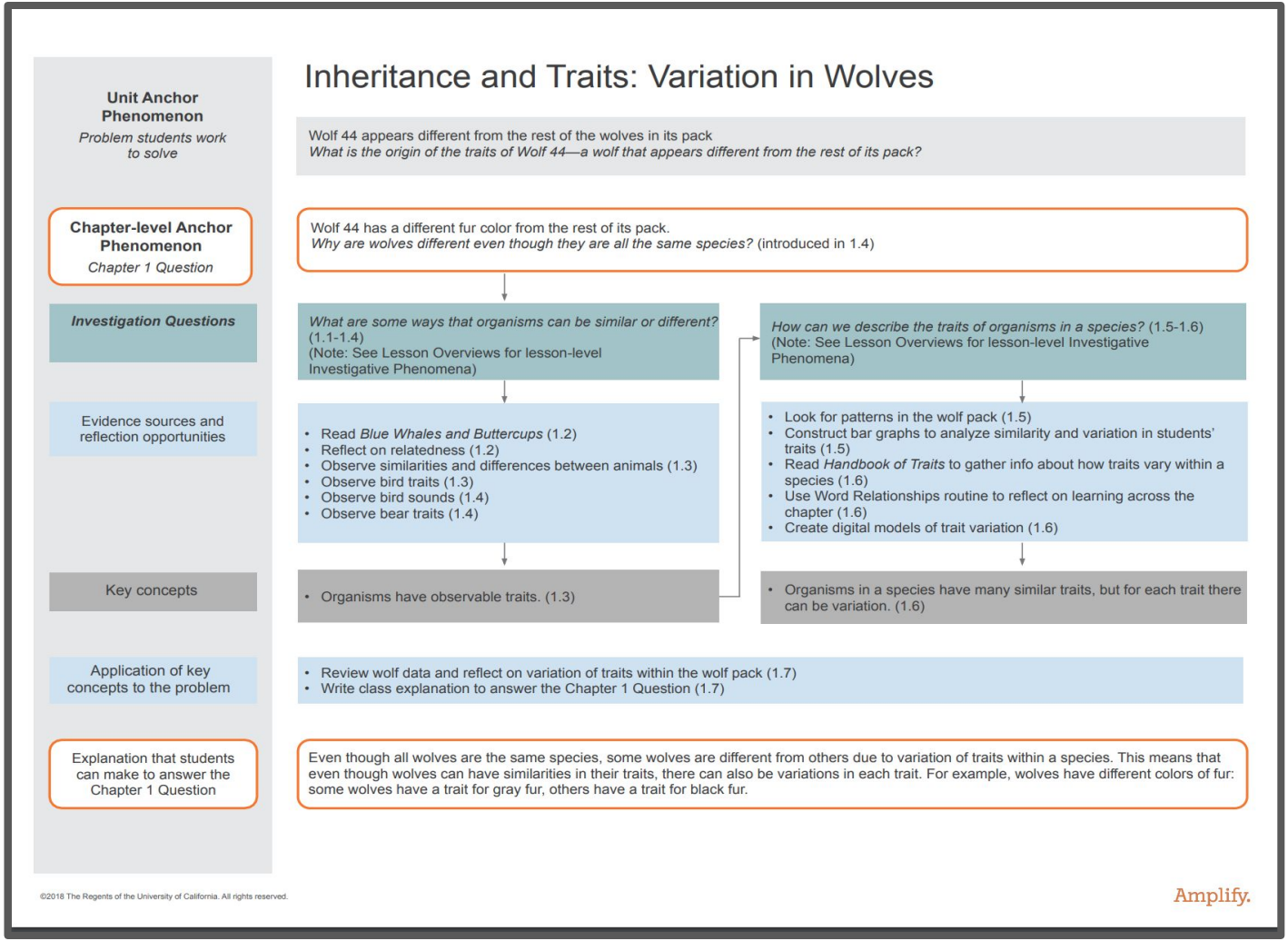


Why isn't Wolf 44 like the Bison Valley Pack in hunting style and size?

How can scientists investigate questions about traits?

Coherence Flowchart

Chapter 1



Inheritance and Traits

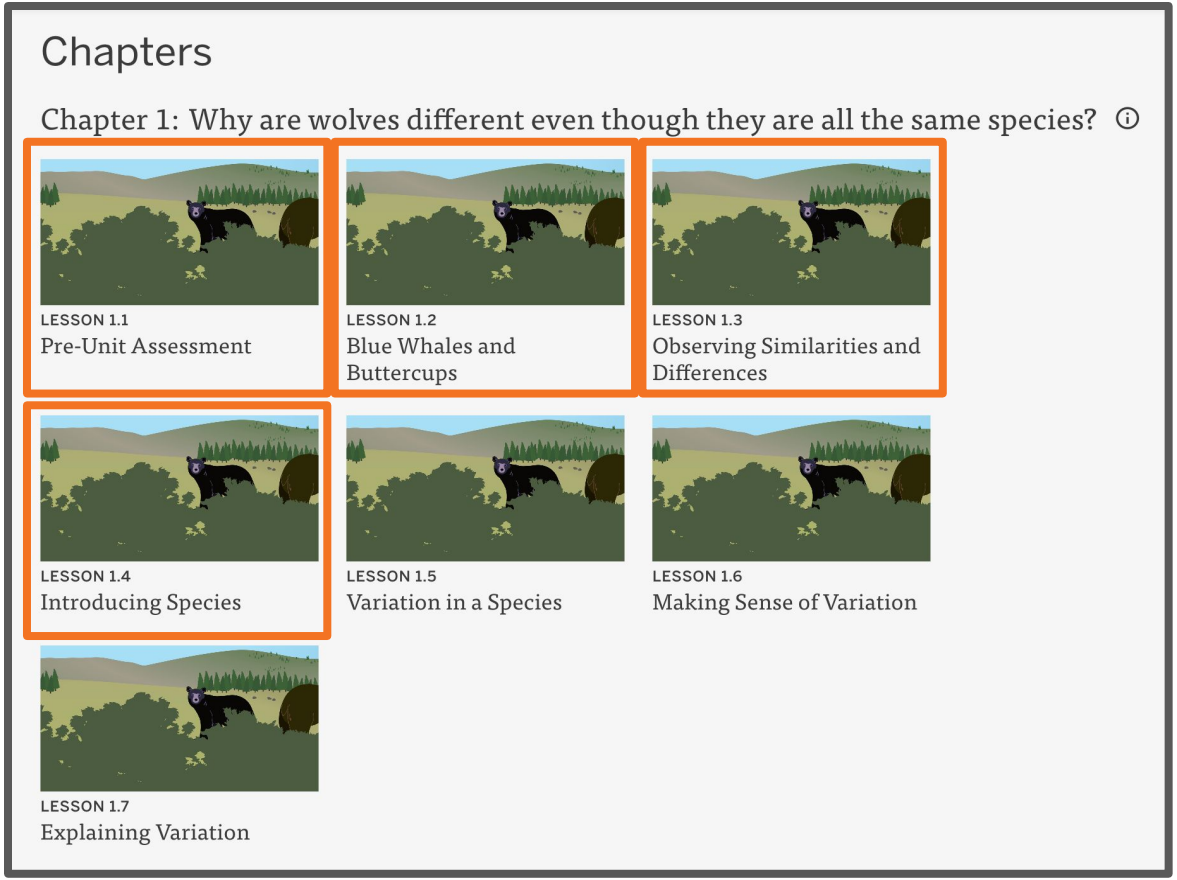
Leading up to our model lesson

L 1.1-Pre-Unit Assessment and Introduction to Phenomenon

L 1.2-Reading Blue Whales and Buttercup

L 1.3-Observe Similiarites and Differences between Animals and Observe Bird Traits

L 1.4-Observe Bird Sounds and Observe Bear Traits



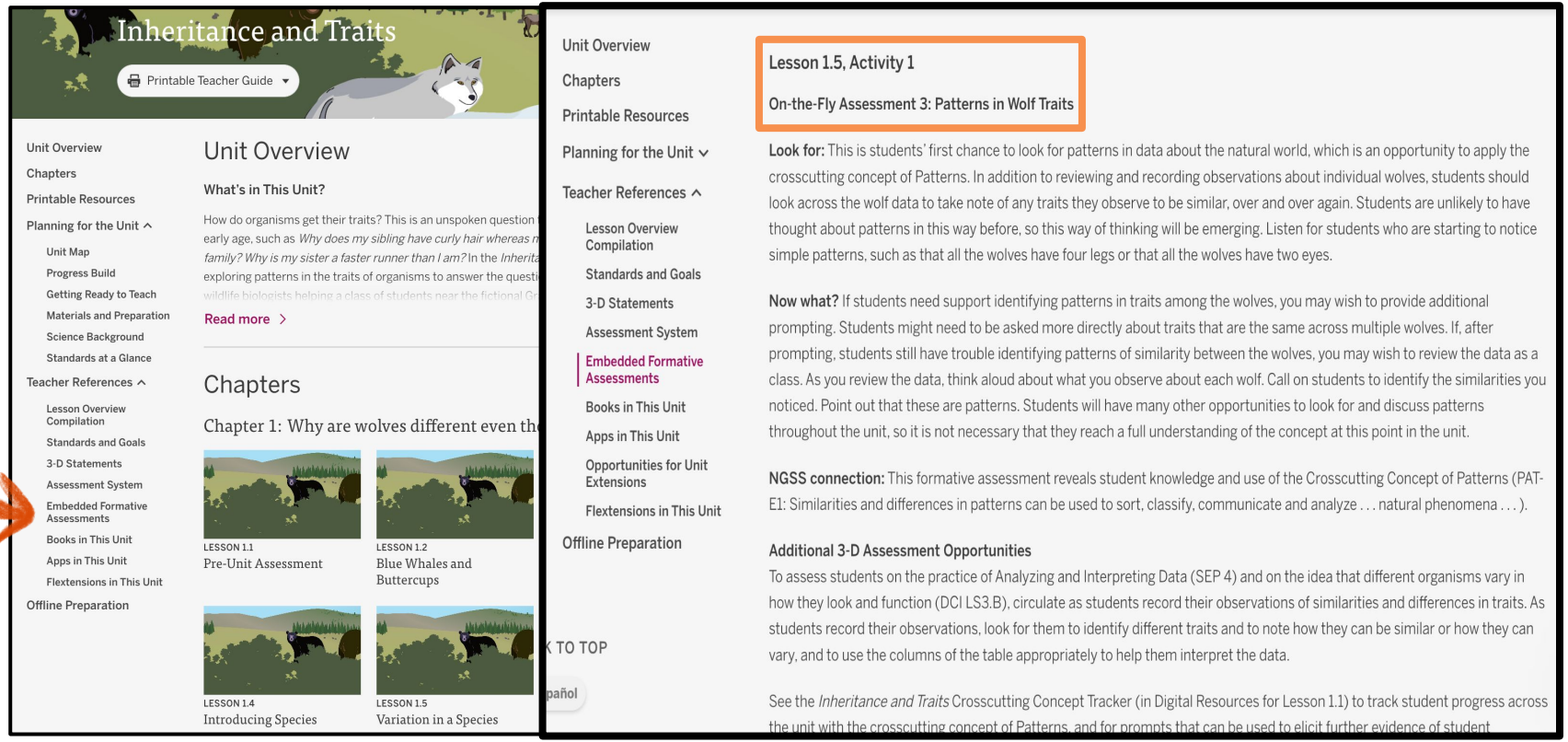
Inheritance and Traits

Model lesson 1.5

- Look for Patterns in the Wolf Pack
- Construct Bar Graphs to Analyze Similarity and Variations in Students' Traits

Embedded Formative Assessments

Inheritance and Traits

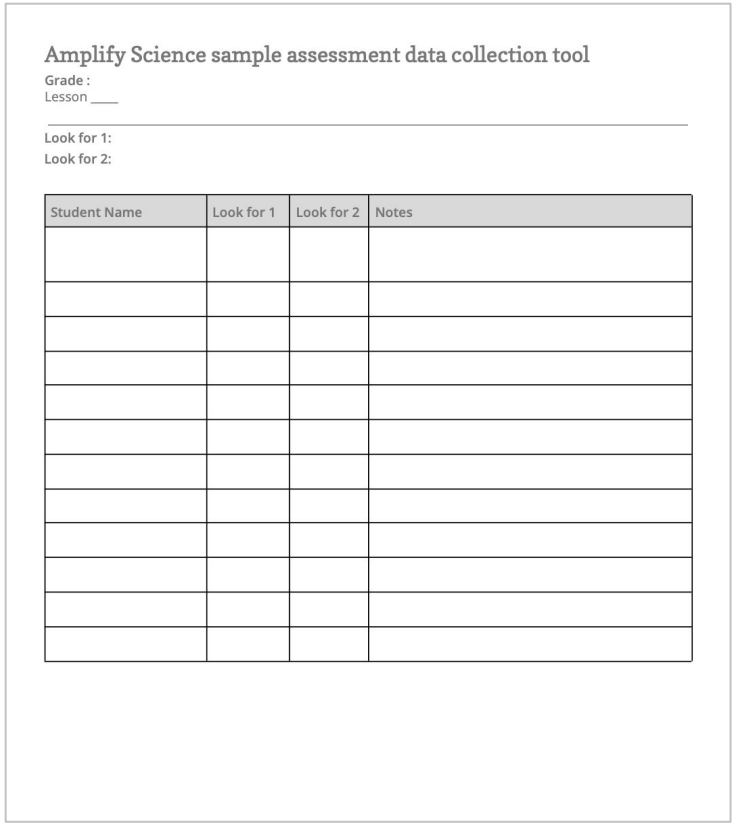


Classroom connection

Collecting formative assessment data

Plan ahead for what you're looking and listening for.

Create a system that's easy for you to use.



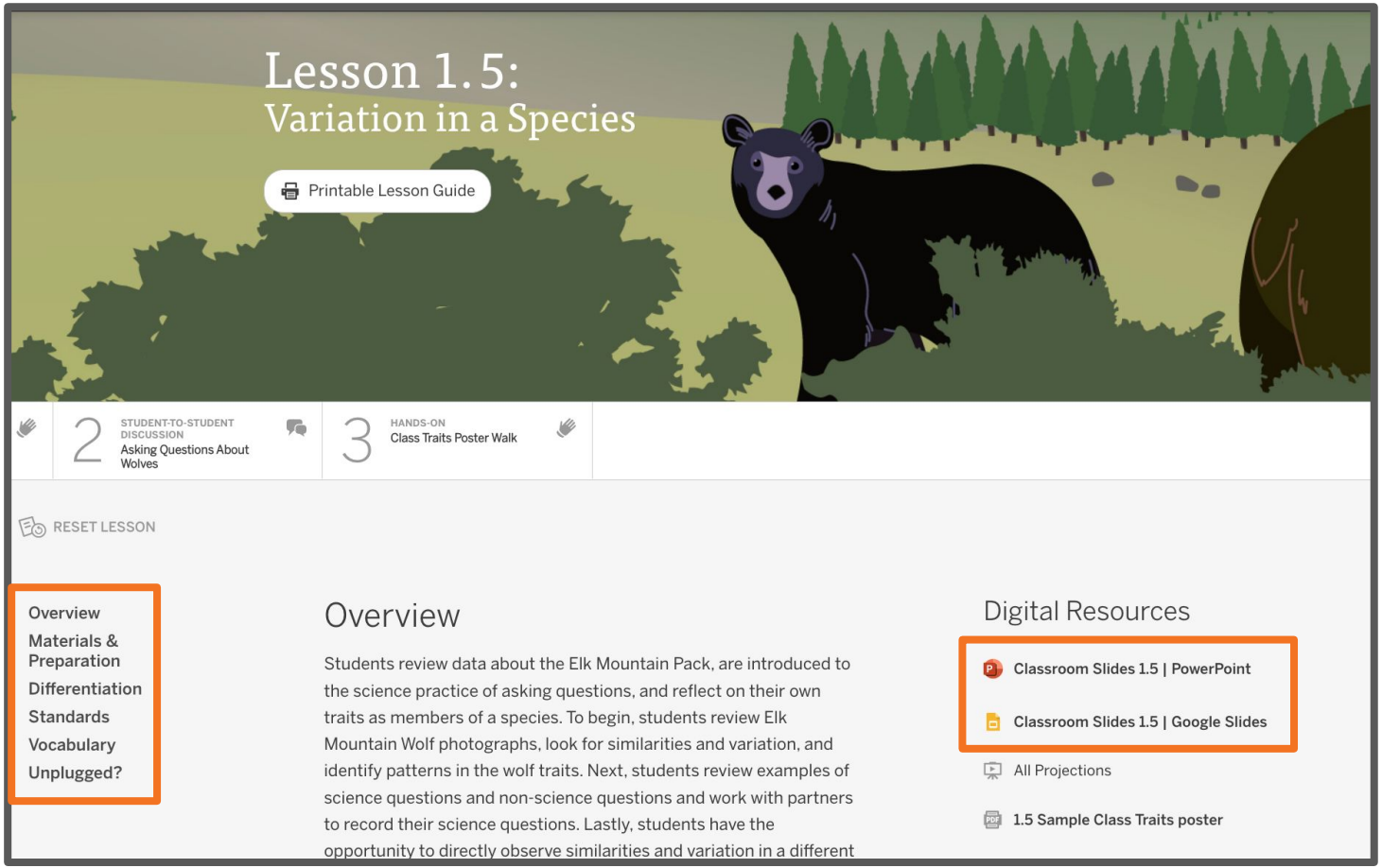
Amplify Science sample assessment data collection tool

Grade :
Lesson ____

Look for 1:
Look for 2:

Student Name	Look for 1	Look for 2	Notes

The Lesson Brief



Inheritance and Traits

For the Classroom Wall

- vocabulary: *data*

For the Class

- Graystone National Park Map 1 mini-poster
- Elk Mountain Pack 1 mini-poster
- Elk Mountain Pack 2 mini-poster
- sets of Elk Mountain Pack Data Cards
- 10 sheets of chart paper*
- 9 stacks of sticky notes*
- marker, wide tip*
- masking tape*
- paper clips*

For Each Group of Four Students

- 1 set of Elk Mountain Pack Data Cards, clipped together (6 cards/set)

For Each Student

- *Inheritance and Traits* Investigation Notebook (pages 11–13)

*teacher provided

4. **Create Si**
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Variations
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5. **Create th**
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Following

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- finge
- eye c
- can s
- a bro
- freck
- dimp
- hair
- earlo
not a

Similarities and Variations: Elk Mountain Pack

Similarities	Traits that have similarity
• pointy ears • four legs • dark fur • have eyes • long nose	• ear shape • having four legs • fur color • having eyes • length of nose

Variations	Traits that have variation
• thicker or thinner fur • some lighter-color fur in places • some have thicker, longer fur	• fur thickness • fur color

er

Pack

book,

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Inheritance and Traits

Classroom Wall (before L1.5)

Problem:

Unit Question: How do organisms get their traits?

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

Investigation Questions: What are some ways that organisms can be similar or different?

Vocabulary:
investigate
organism
trait
pattern
observe
species
variation

Key Concept:

Organisms have observable traits.

Key Concept:

Grade 3 | Inheritance and Traits

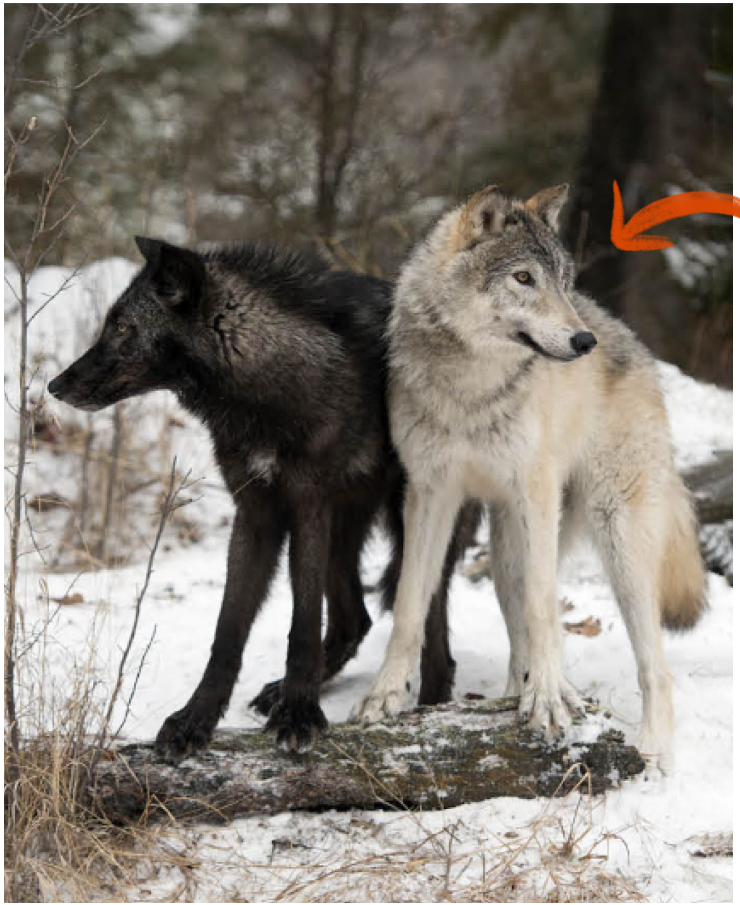
Lesson 1.5: Variation in a Species

AmplifyScience

20 MIN

Activity 1

Looking for Patterns in the Wolf Pack



Remember, our task is to help the students at Graystone Elementary School understand **why Wolf 44 looks different** than the other wolves in its pack.

Chapter 1 Question

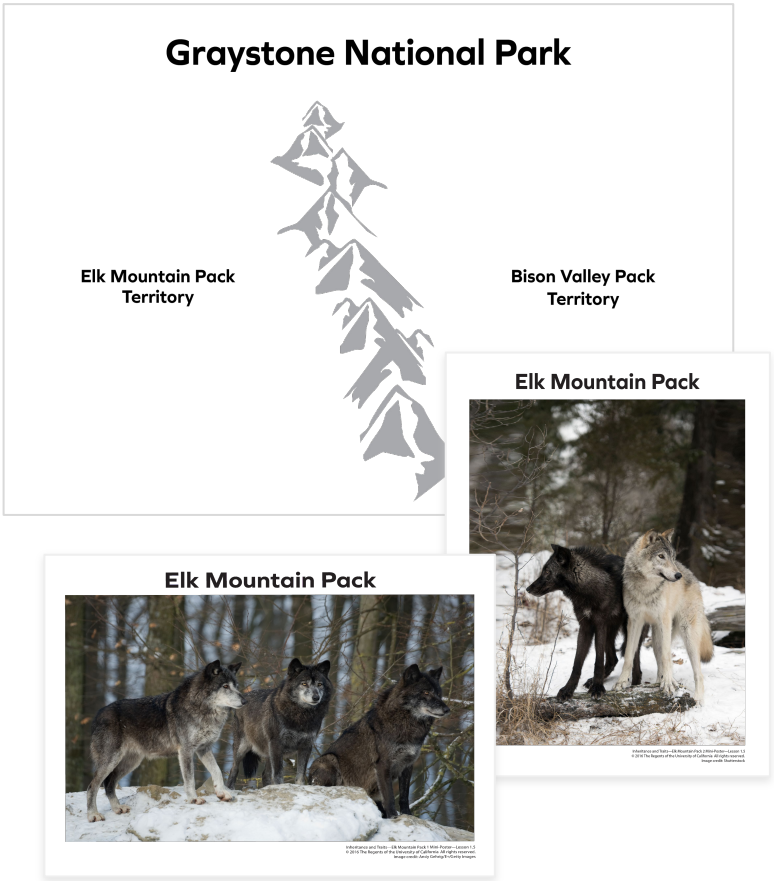
Why are wolves different even though they are all the same species?

Think back to sorting the songbirds and bears into groups by traits.

What are some **ideas you have about traits** from what you have learned so far?

Today, we are going to investigate this question:

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



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?

_____

_____

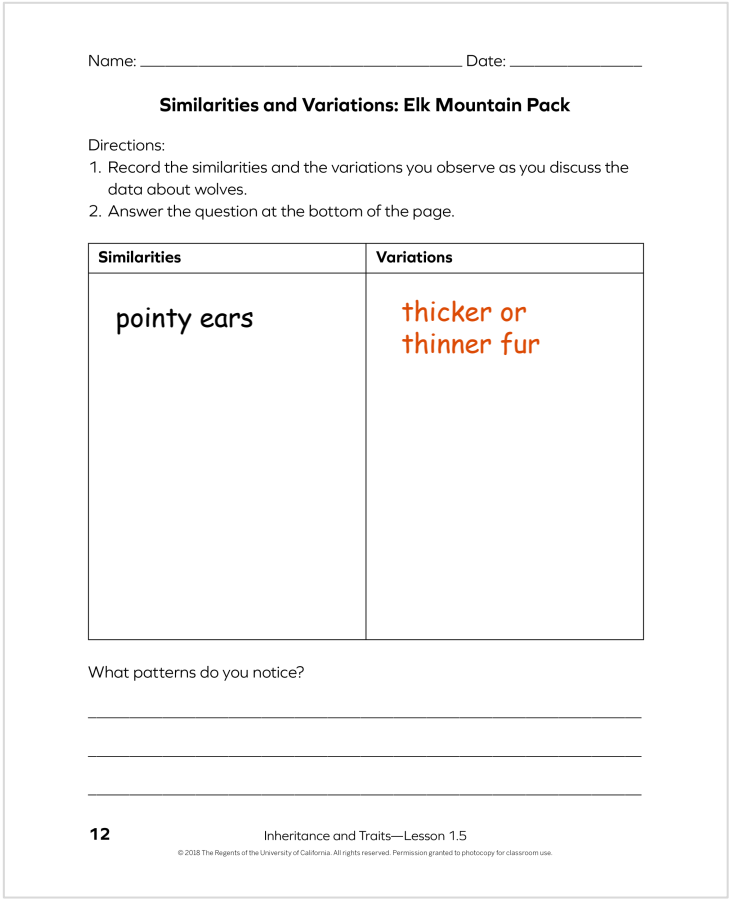
_____

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

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

Now, let's think about **variations** we can observe.

We can see that some of the wolves on the cards have **thicker fur** than others.



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?

_____

_____

_____

12 Inheritance and Traits—Lesson 1.5

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

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

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?

_____

_____

_____

Observe the wolves on the cards.

Record similarities and variations on **your own notebook page**.

Similarities and Variations: Elk Mountain Pack

Similarities	Traits that have similarity
	

Variations	Traits that have variation
	

We will use this chart to record our observations.

What are some **similarities and variations** you observed?

Similarities and Variations: Elk Mountain Pack

Similarities	Traits that have similarity
pointy ears	ear shape

Variations	Traits that have variation

Let's think about the **traits** that have **similarity.**

One similarity is pointy ears. That trait is **ear shape**. We can write *ear shape* next to *pointy ears*.

Similarities and Variations: Elk Mountain Pack

Similarities	Traits that have similarity
pointy ears	ear shape 

Variations	Traits that have variation

Now, we can work together to record the rest of the **traits that have similarity**.

We will look at each similarity and figure out what the trait is.

Similarities and Variations: Elk Mountain Pack

Similarities	Traits that have similarity
pointy ears	ear shape

Variations	Traits that have variation
thicker or thinner fur	fur thickness

Next, we will look at the **traits** that have variation.

One variation is that some wolves have thicker fur, and some have thinner fur. That trait is **fur thickness**.

Similarities and Variations: Elk Mountain Pack

Similarities	Traits that have similarity
pointy ears	ear shape

Variations	Traits that have variation
thicker or thinner fur	fur thickness

Let's work together to record the rest of the **traits that have variation**.

We will look at each variation and figure out what the trait is.

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?

_____

_____

_____

Now, **write** about the **patterns** you noticed.

Use your observations and our chart to help you decide what to write.

ON-THE-FLY

Remember, a pattern is something you observe to be similar over and over.

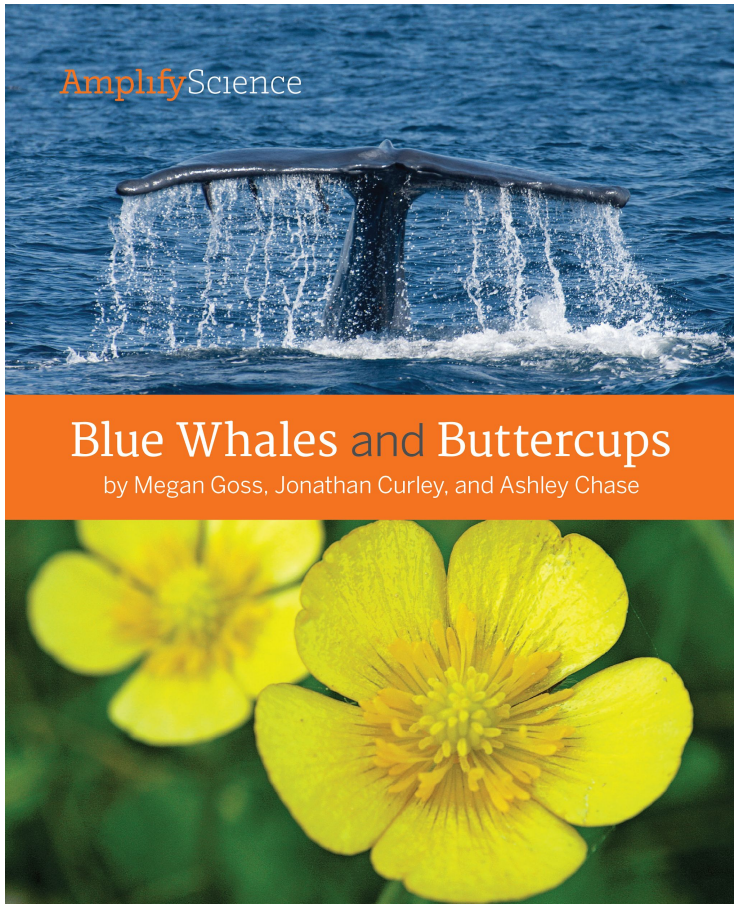
What is a **pattern** you noticed about the wolves in the Elk Mountain Pack?

Based on the **data** you observed, what can we say about **traits** in the wolf species?

15 MIN

Activity 2

Asking Questions About Wolves



When we read *Blue Whales and Buttercups* we **asked questions** to help us understand what we read.

Scientists **ask questions** when they **investigate**, too.

We will read a list of questions.

One of the lists has **science questions**, and the other has **non-science questions**.

As I read, listen carefully for how the two kinds of questions are different.

Science questions	Non-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?	• 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?

Name: _____ Date: _____

Asking Science Questions

With your partner, record at least three science questions you have about Wolf 44 or the other wolves in the pack.

Question 1: _____

_____

_____

Question 2: _____

_____

_____

Question 3: _____

_____

_____

Question 4: _____

_____

_____

Question 5: _____

_____

_____

Turn to page 13 in your notebooks. Let's go over the directions together.

Think of and record some science questions about the Elk Mountain wolves.

What **questions** did you record?

Is your question about:

- how the world works?
- why something happens the way it does?
- what the world is like?

25 MIN

Activity 3

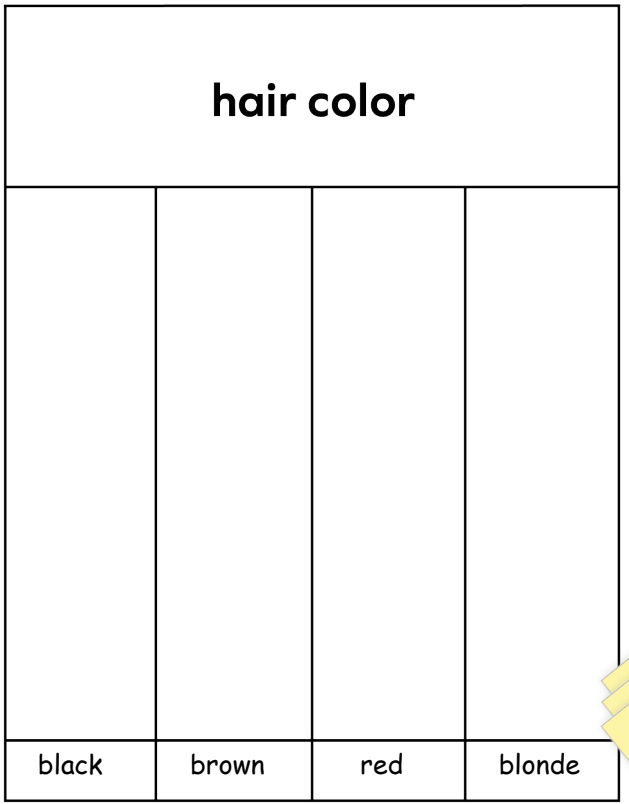
Class Traits Poster Walk

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.

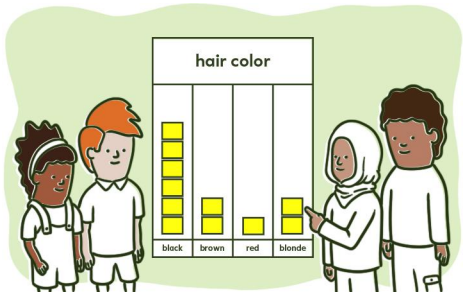
What are some **traits humans have** that you can observe?



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

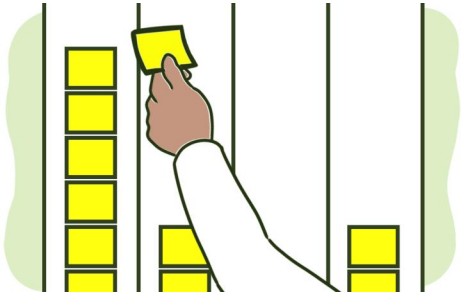
We will place sticky notes to show how many students have each trait.

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

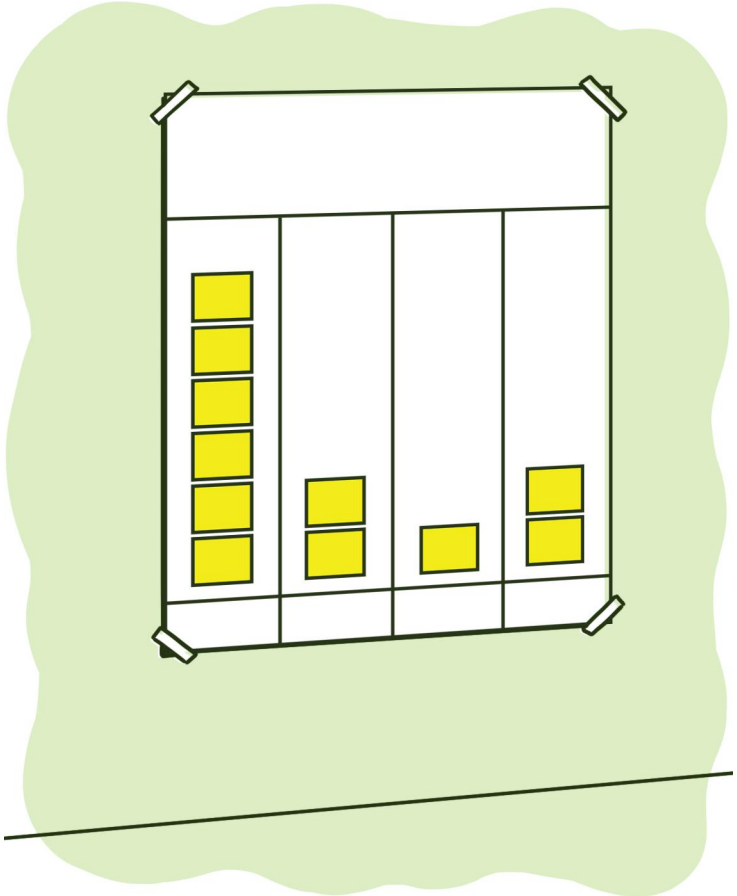
When you hear the signal, move with your group to the next poster.

Now, let’s take a look at the **bar graphs we created**.

In these bar graphs, each sticky note represents a student with a particular trait.

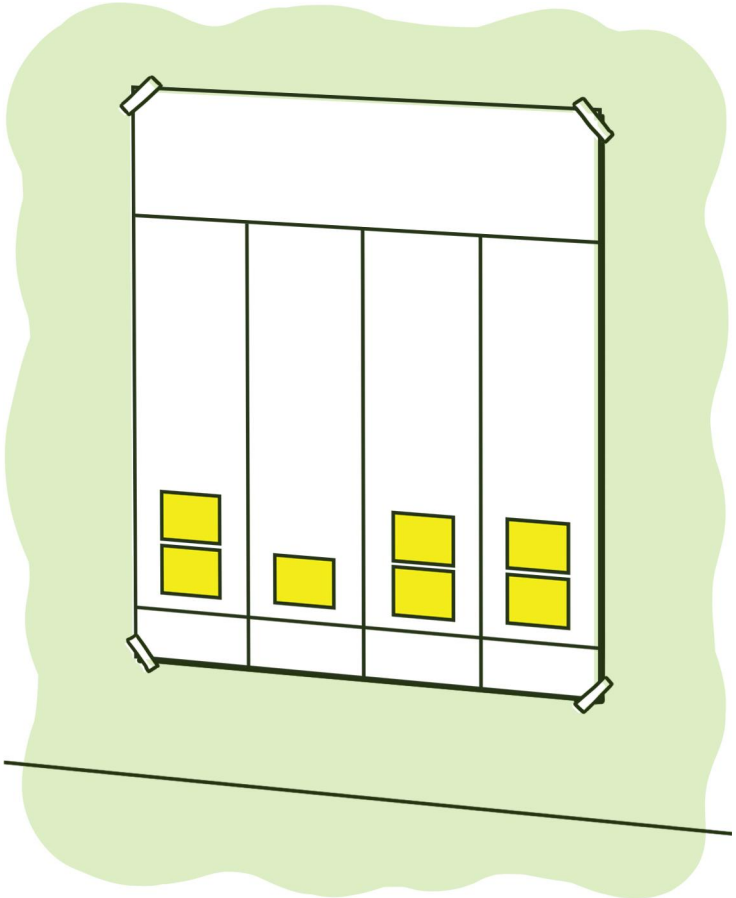
Scientists use graphs to help them look for patterns.

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



On some posters, most of the sticky notes were all stacked on one trait.

That means most of the **traits in this category were similar**.



On some of our posters, the sticky notes were spread out across the bars.

That means there was **variation in the traits in this category**.

What are some **other patterns** you notice as you observe these bar graphs?

Like scientists, we created graphs to organize information about traits.

How were these graphs helpful for thinking about the traits we share?

End of Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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Inheritance and Traits

Classroom Wall (after L1.5)

Problem:

Unit Question: How do organisms get their traits?

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

Investigation Questions: What are some ways that organisms can be similar or different?

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

Key Concept:

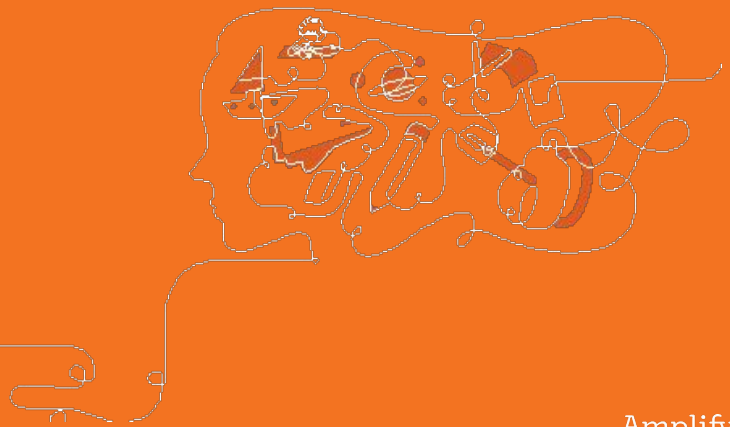
Organisms have observable traits.

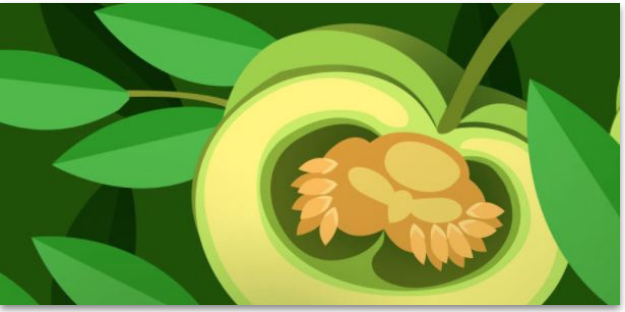
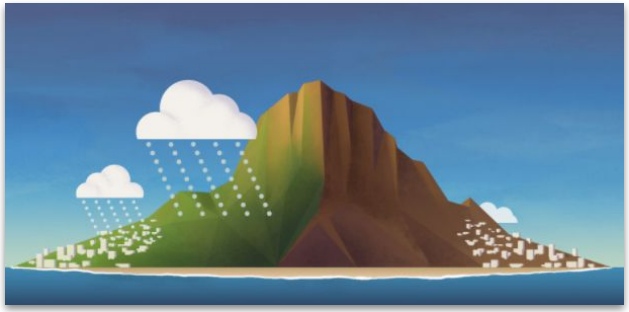
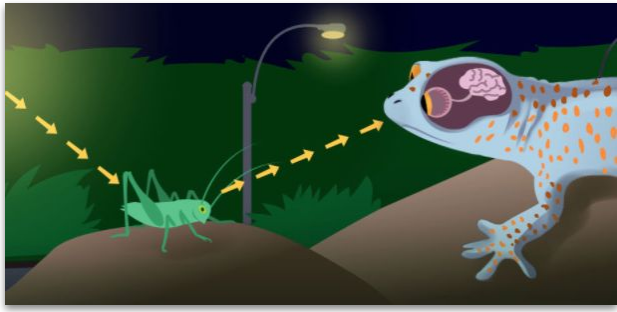
Key Concept:

Vocabulary:

investigate
organism
trait
pattern
observe
species
variation
data

Break



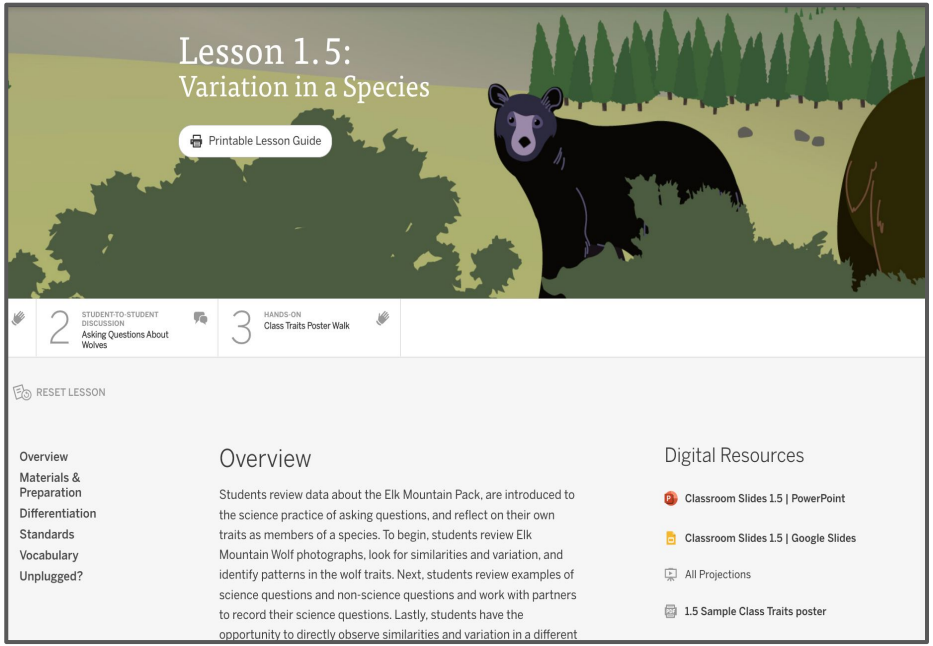




Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Work time - Planning

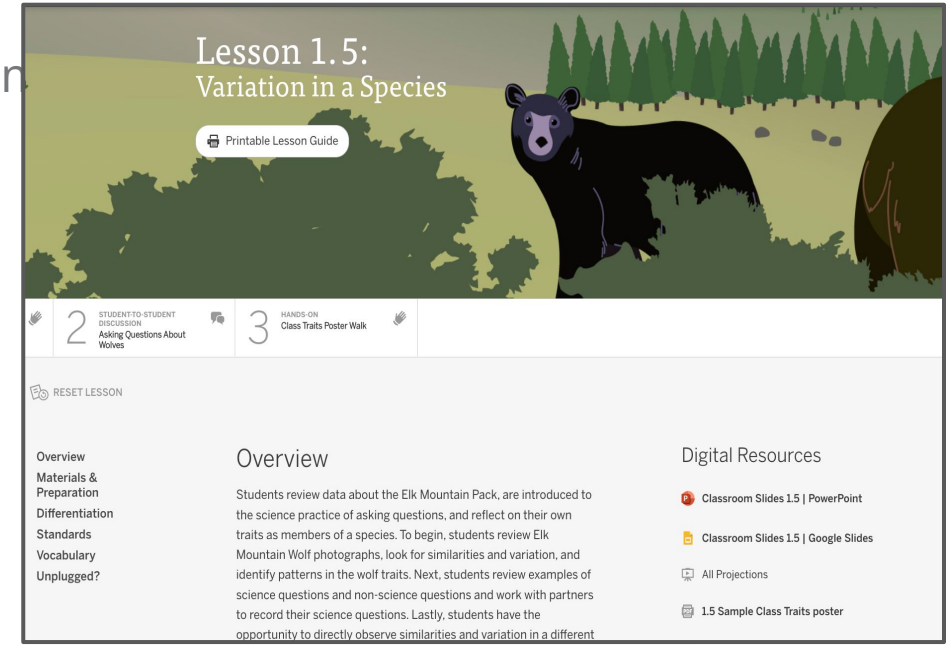
- Navigate to a lesson that you'll be teaching in the upcoming week that has a formative assessment opportunity (you might want to refer to the **Embedded Formative Assessment or Assessment System** documents on the Unit Landing Page)
- Review the assessment type and guidance



Work time - Planning

Pg. 17=18

- Download and review the classroom slides
- Read the unit overview
- Read the Materials and Prep
- Read the differentiation
- Prepare any data collectors or assessment materials needed.

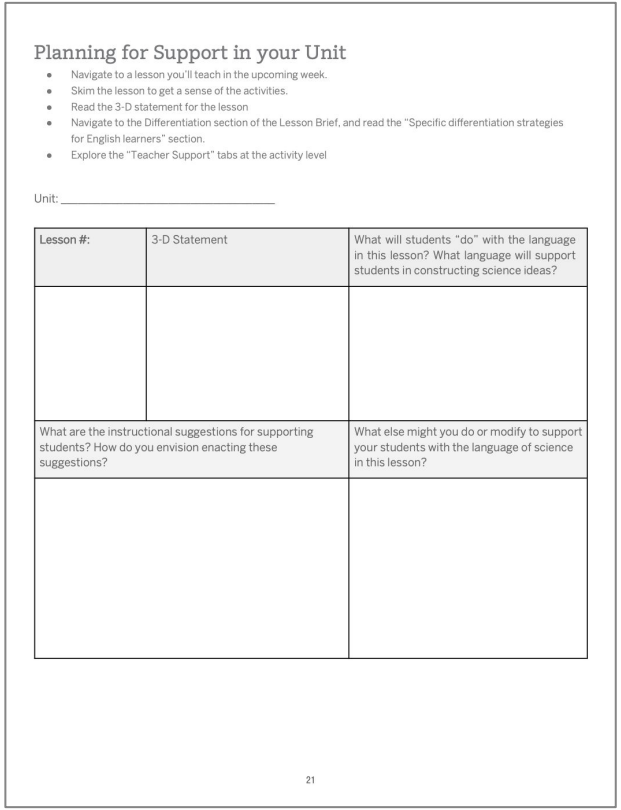


Work time - Planning

Be prepared to share out the:

- Lesson chosen
- Type of assessment
- “Look Fors” or “Assess for Understanding”
- “Now What” or “Tailor Instruction”
- Personal observations or reflections

Pg. 17=18



Planning for Support in your Unit

- Navigate to a lesson you'll teach in the upcoming week.
- Skim the lesson to get a sense of the activities.
- Read the 3-D statement for the lesson
- Navigate to the Differentiation section of the Lesson Brief, and read the "Specific differentiation strategies for English learners" section.
- Explore the "Teacher Support" tabs at the activity level

Unit: _____

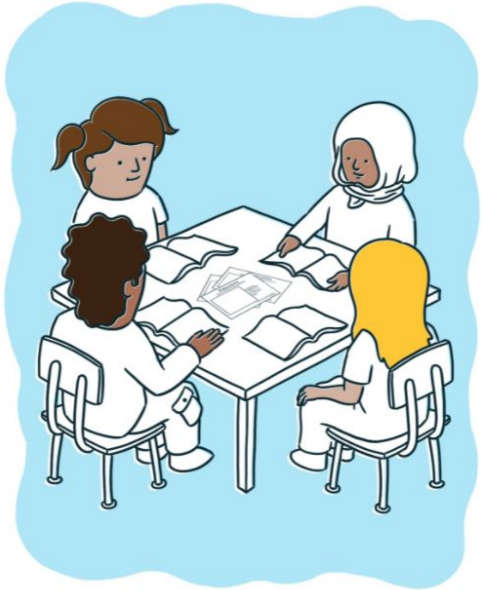
Lesson #:	3-D Statement	What will students "do" with the language in this lesson? What language will support students in constructing science ideas?
What are the instructional suggestions for supporting students? How do you envision enacting these suggestions?		What else might you do or modify to support your students with the language of science in this lesson?

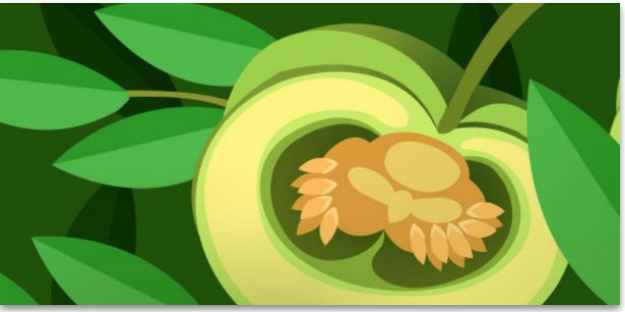
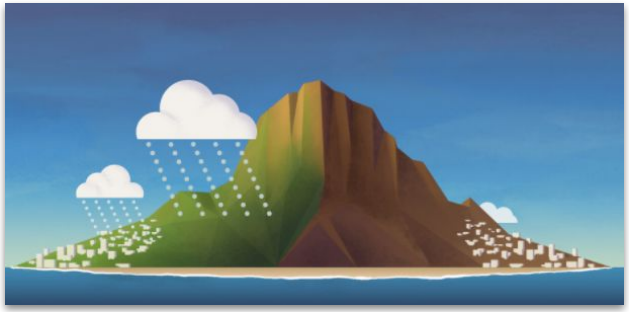
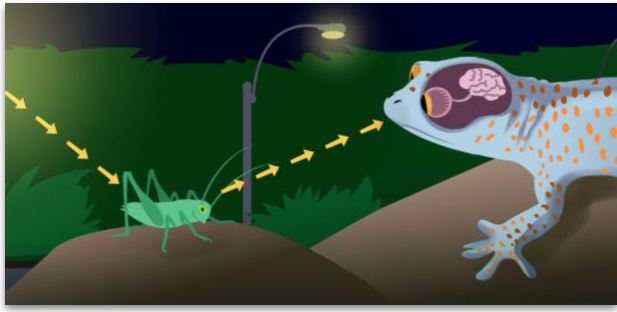
21

Share Out

Share:

- Lesson chosen
- Type of assessment
- “Look Fors” or “Assess for Understanding”
- “Now What” or “Tailor Instruction”
- Personal observations or reflections



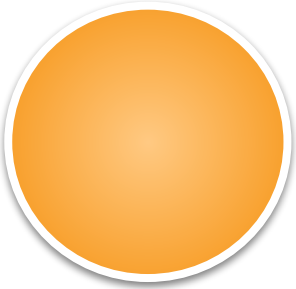
Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Closing reflection

Based on our work today, share:

1-3 big points you're taking away from this session

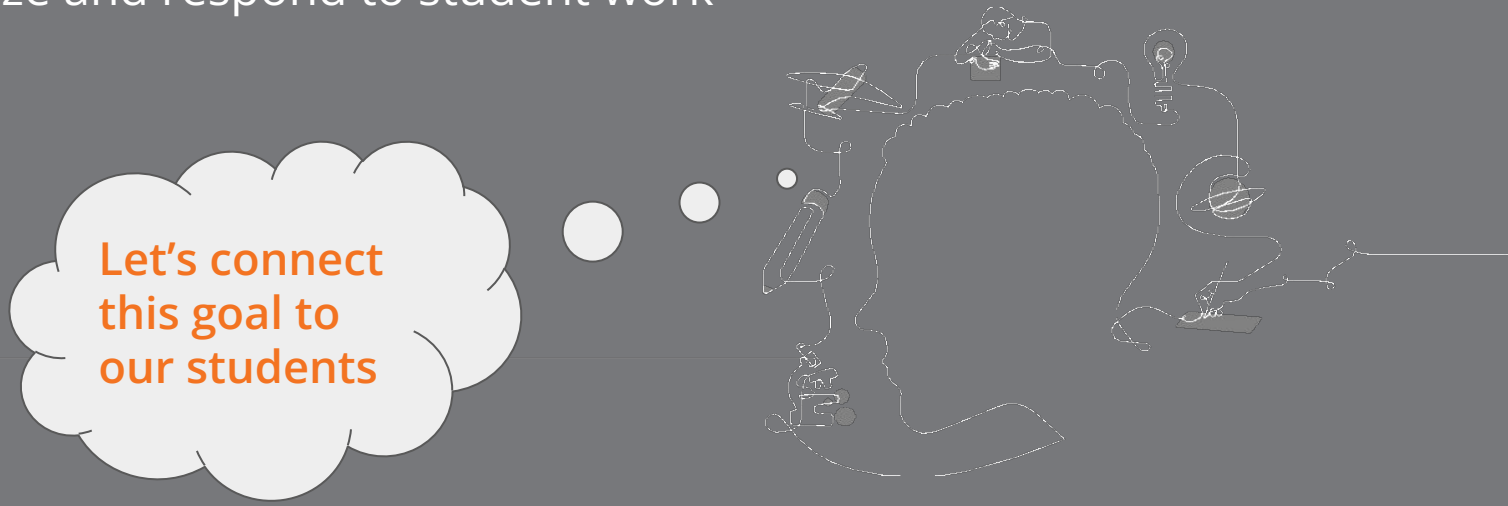


A question or topic that's still circling in your mind

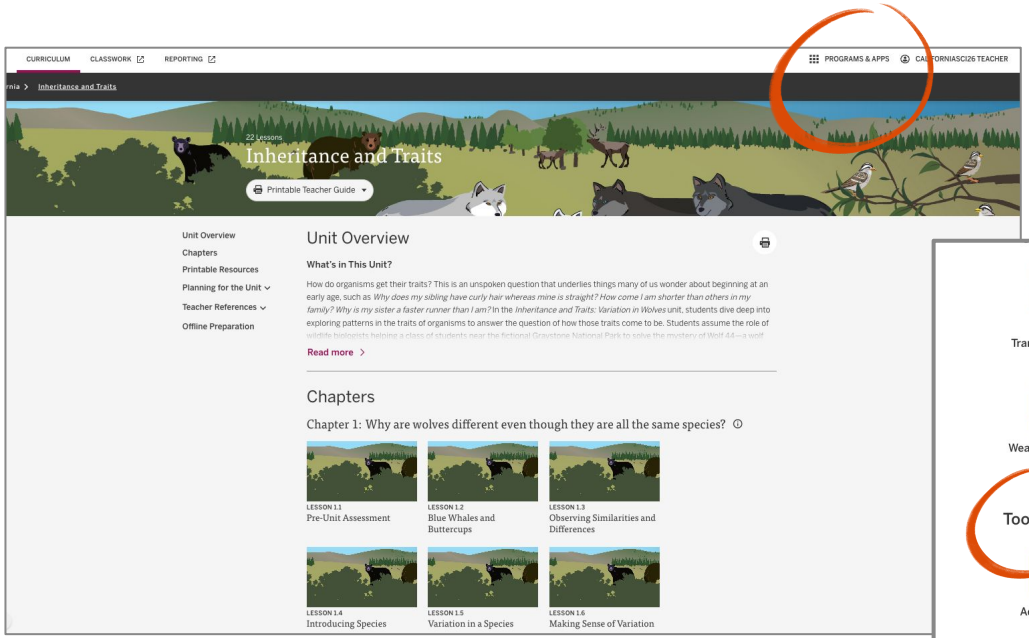
Something that's "squaring" (resonating) with you from this session

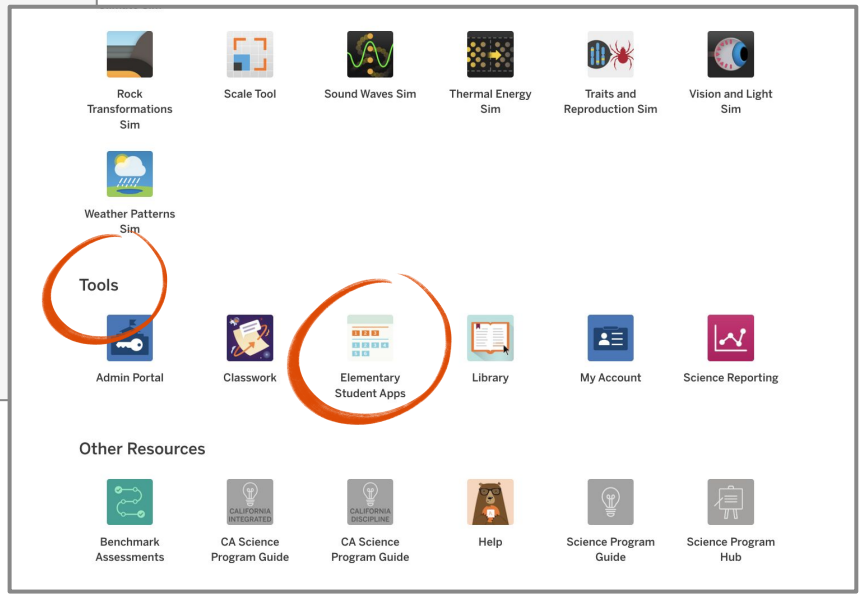
Overarching goals

- ☑ Describe the structure and purpose of the Amplify Science Assessment System
- ☑ Plan for the strategic use of assessment resources to analyze and respond to student work

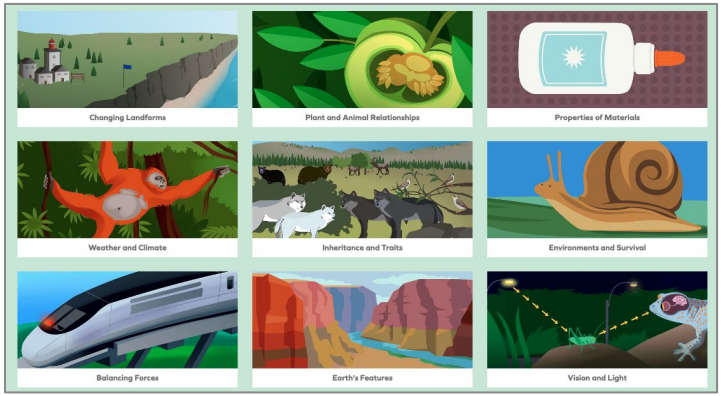


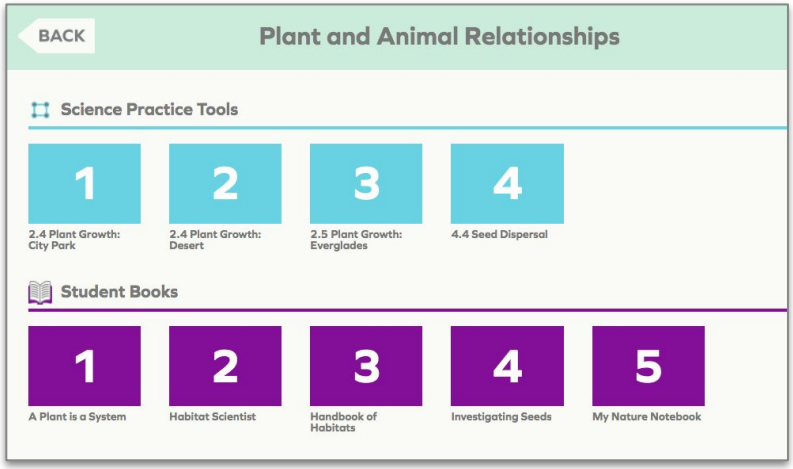
Navigating to the Student Apps page

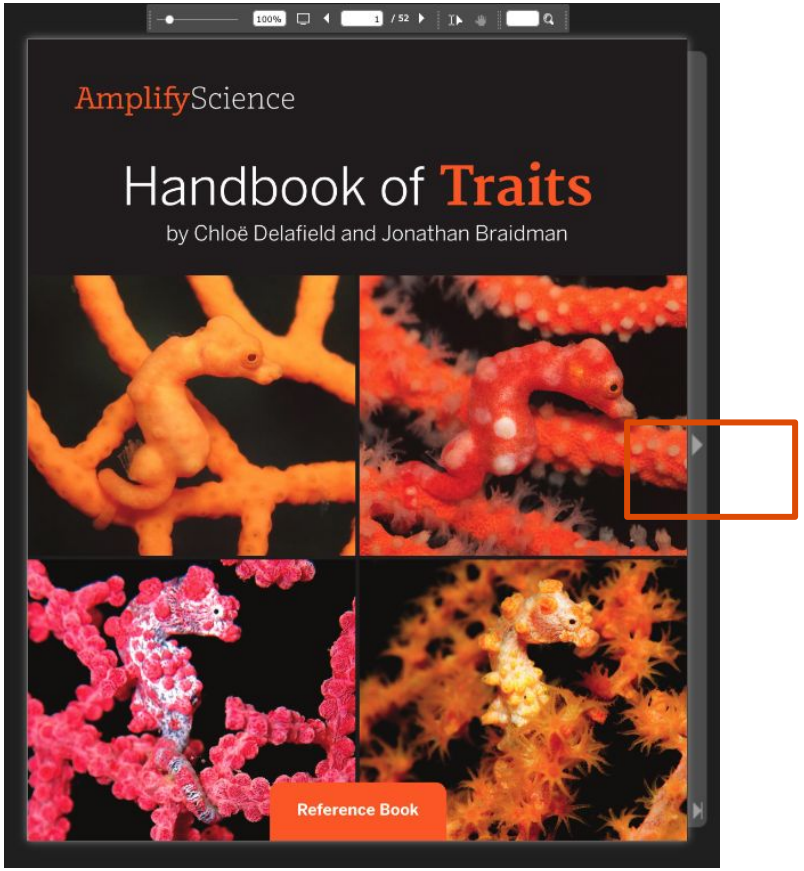




Student Apps page and accessing the book

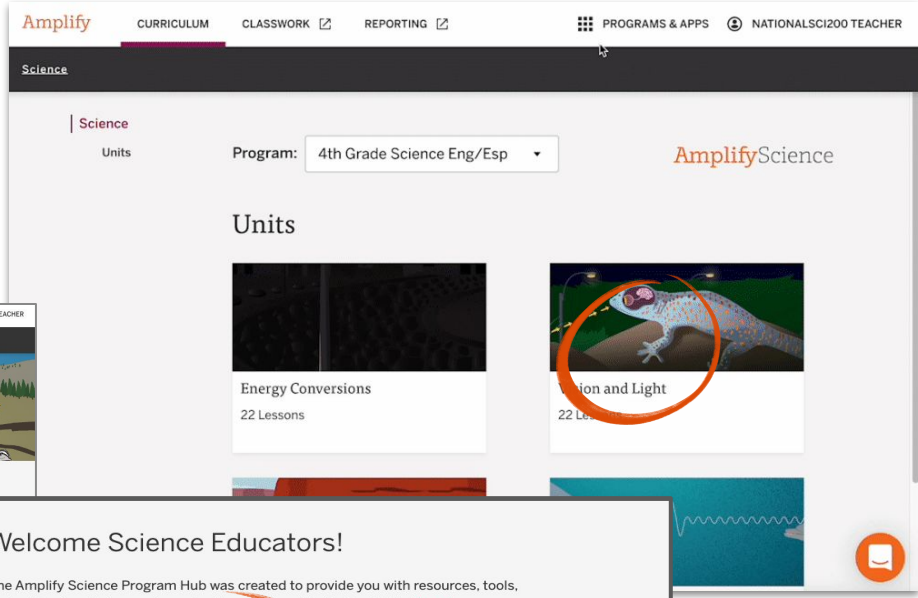


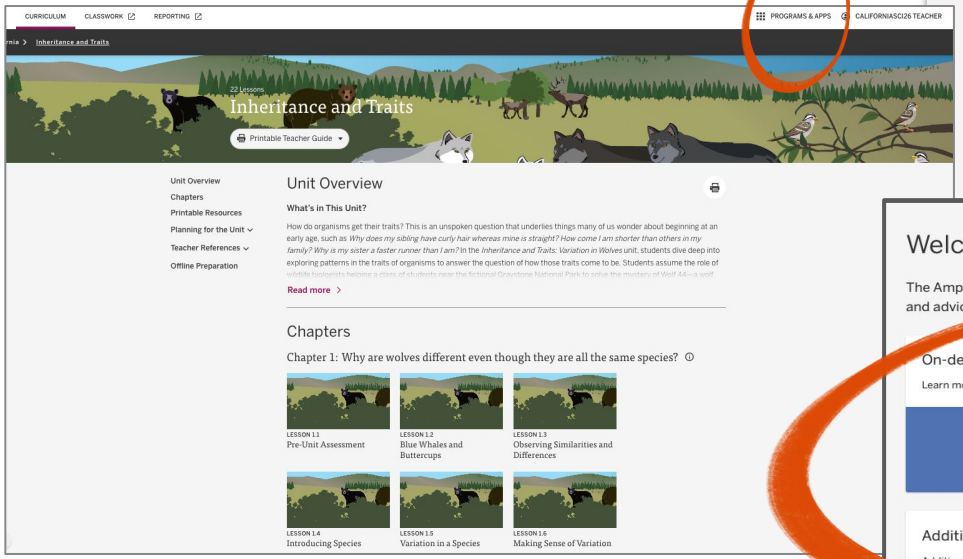


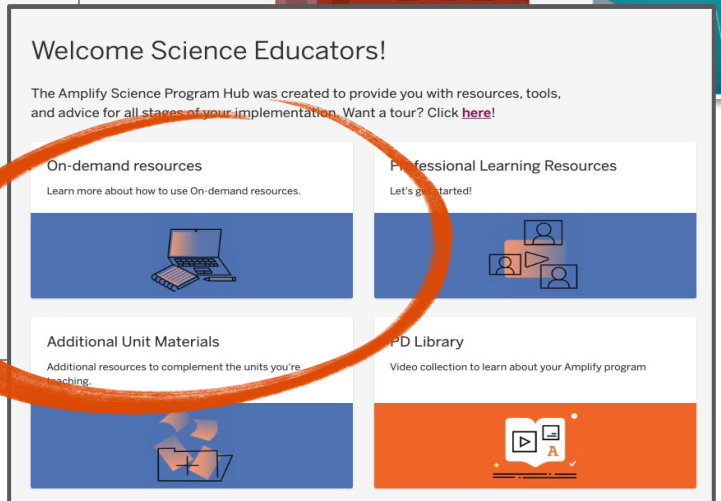


Program Hub

Use the Amplify Science Program Hub to find useful resources for implementing Amplify Science, including unit overview videos and planning tools.







Additional resources and ongoing support

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support.

Amplify Chat