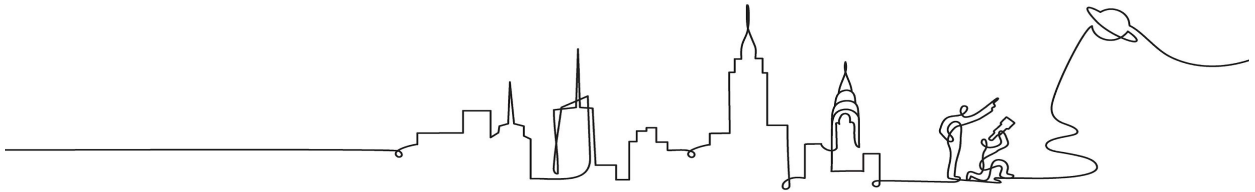
Welcome to Amplify Science!

Follow the directions below as we wait to begin.

1. Please log in to your Amplify Account.

2. Sign in using link dropped in chat.

3. In the chat, share your name, grade level, and school you teach in.

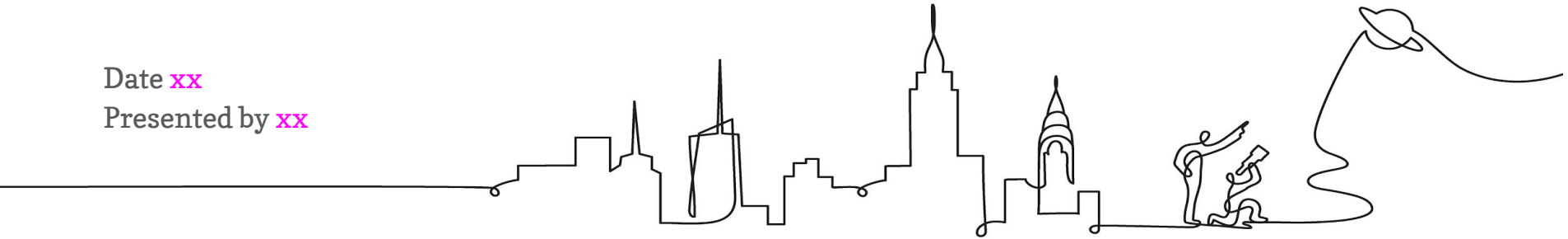


Amplify Science
New York City

Academic Discourse & Questioning Strategies in the Amplify Science Classroom

Grade 4

Date xx
Presented by xx



Remote Professional Learning Norms

Take some time to orient yourself to the platform

- *"Where's the chat box? What are these squares at the top of my screen?, where's the mute button?"*

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

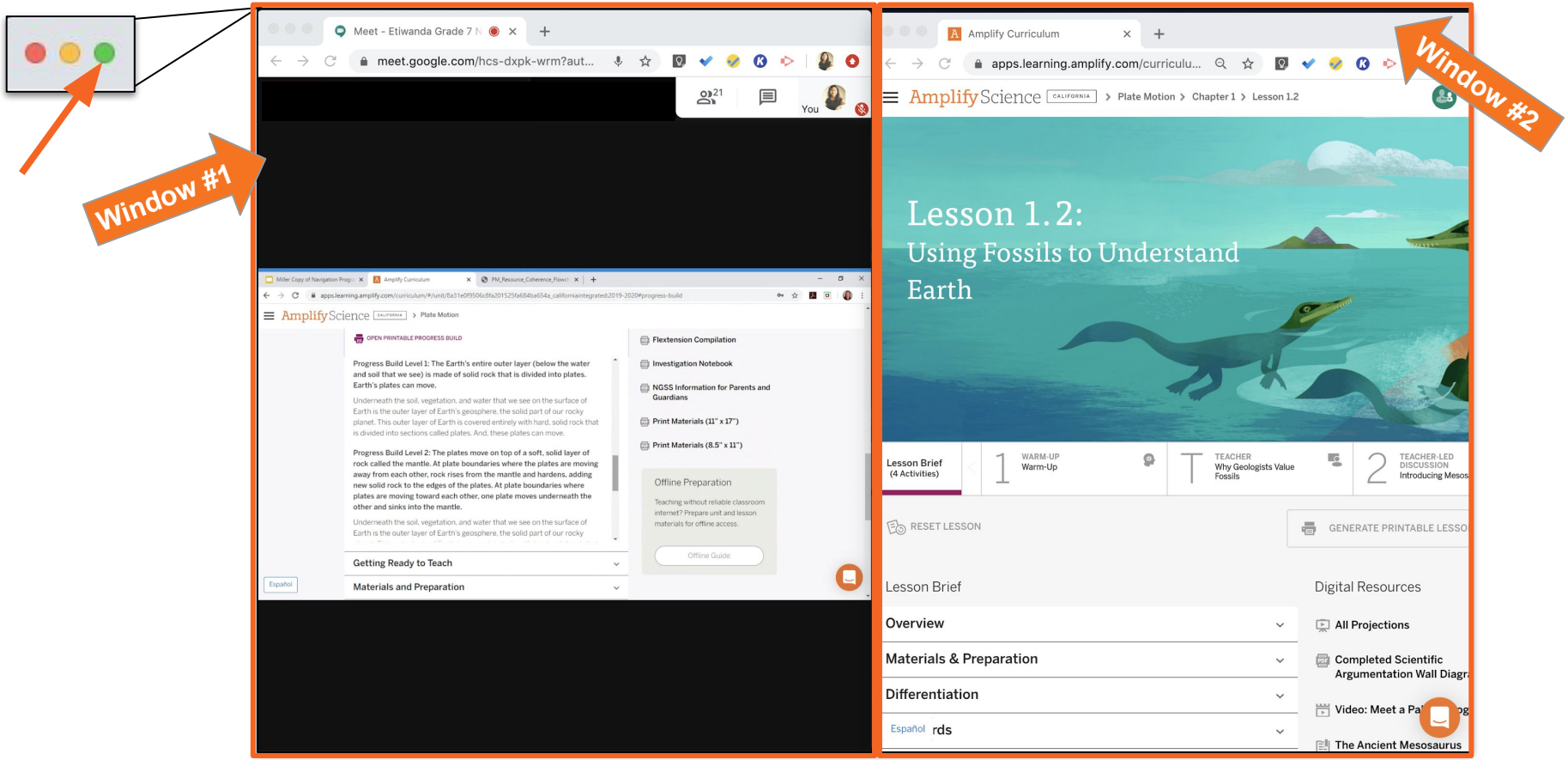
The chat box is available for posting questions or responses to during the training

Make sure you have a note-catcher present

Engage at your comfort level - chat, ask questions, discuss, share!

Amplify.

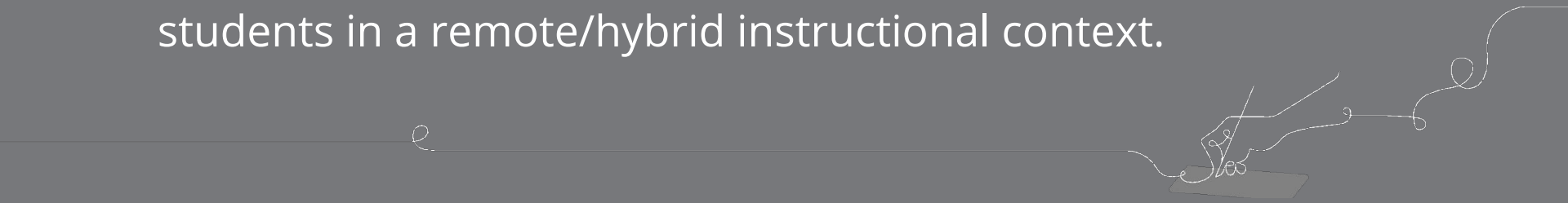
Use two windows for today's webinar



Objectives

By the end of this 1-hour workshop, you will be able to...

- Elaborate on the central role academic discourse & questioning strategies play in 3-dimensional, multimodal learning.
- Adapt Amplify Science discourse routines, questioning strategies, and the classroom wall to meet the needs of all students in a remote/hybrid instructional context.



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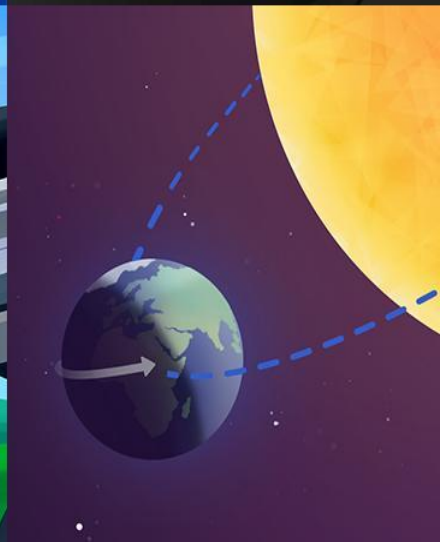


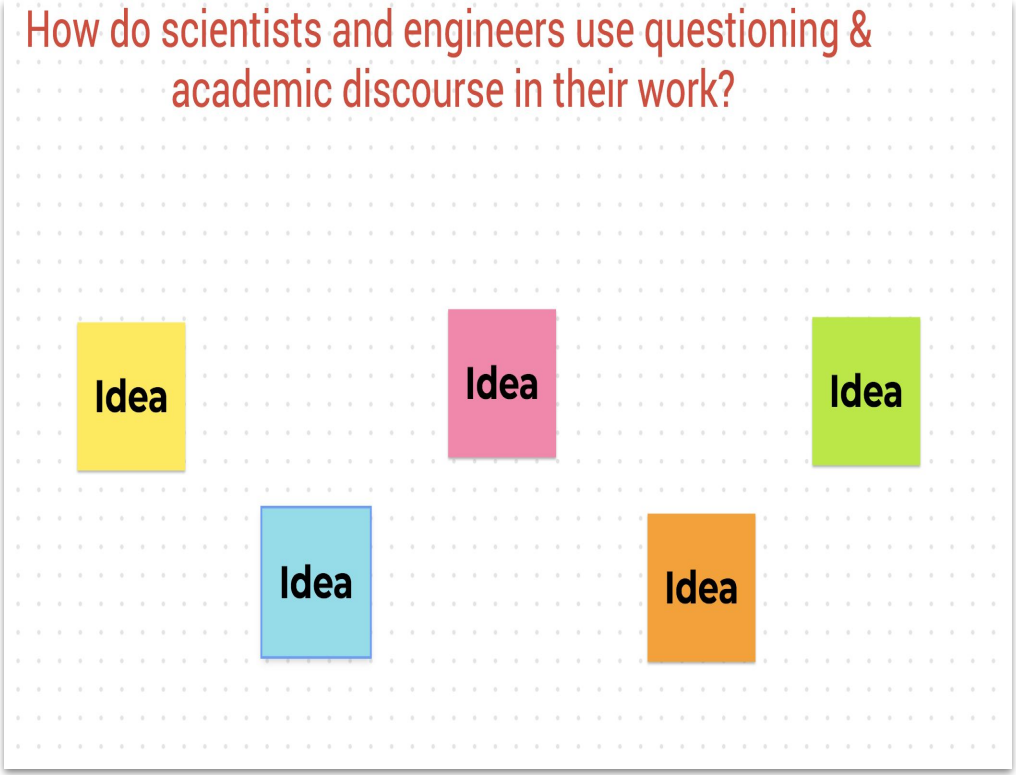
Plan for the day

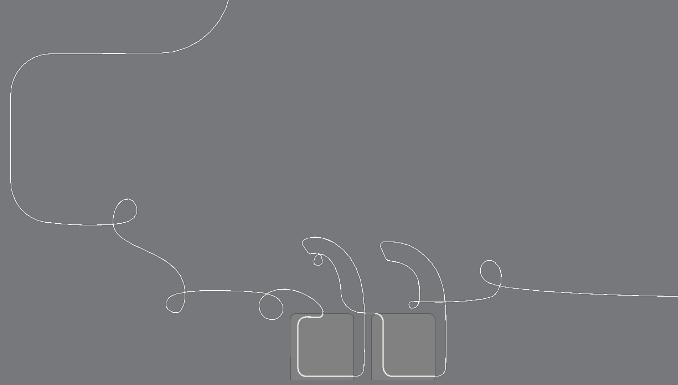
- **Framing the day**
  - Welcome and introductions
  - Anticipatory activity
- **Amplify Science approach review**
  - 3-Dimensional learning
  - Multiple modalities
- **Amplify Science discourse routines**
  - @Home Unit lesson analysis
- **Questioning strategies**
  - Remote/hybrid adaptations
- **Classroom wall**
  - Unit, chapter, & investigation questions
  - Remote classroom wall
- **Closing**
  - Reflection & additional resources
  - Survey

Anticipatory activity

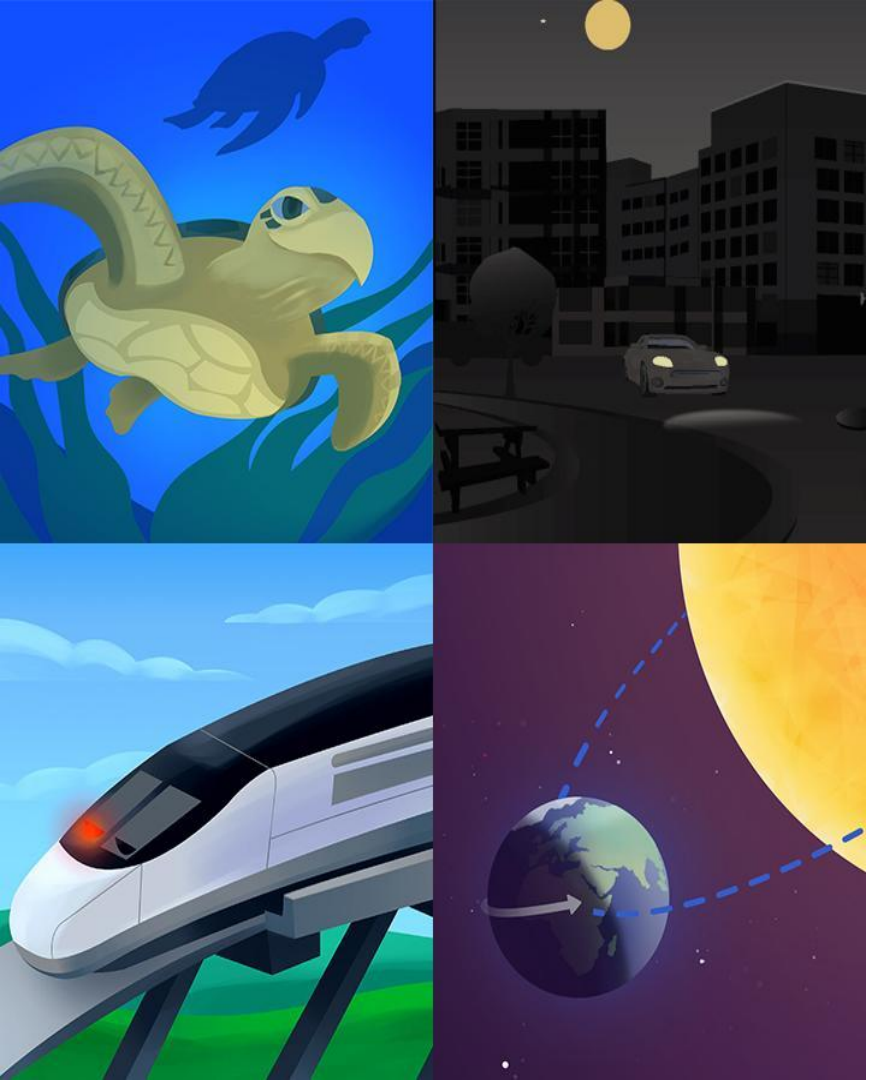
On the Jamboard "post"….

- your **ideas** on how scientists and engineers use **questioning** & academic **discourse** in their work.





Questions?



Plan for the day

- **Framing the day**
  - Welcome and introductions
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  - 3-dimensional learning
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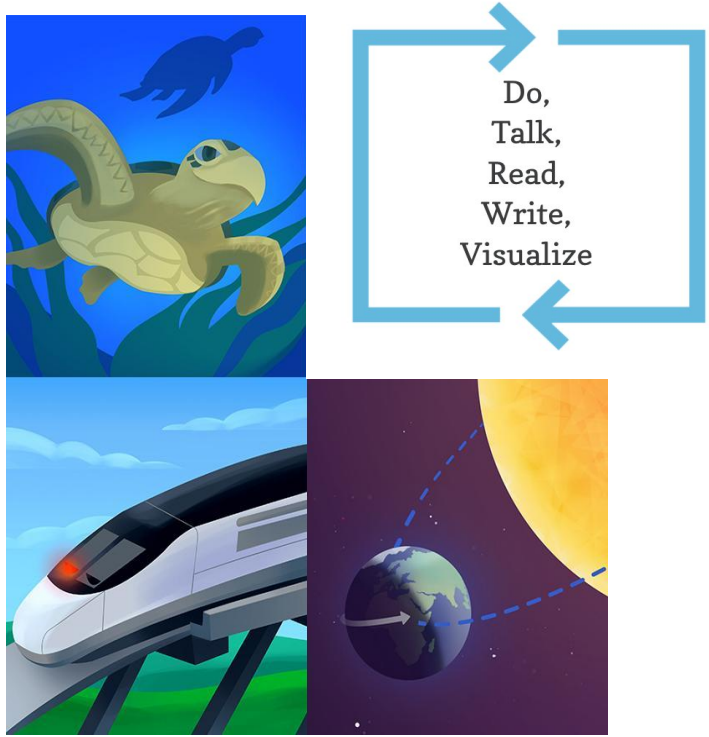
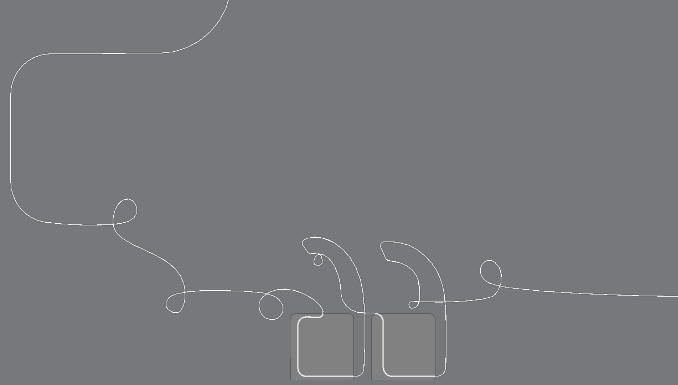
Multimodal, phenomenon-based learning

In each Amplify Science unit, students embody the role of a scientist or engineer to **figure out phenomena**.

They gather evidence from multiple sources, using multiple modalities.



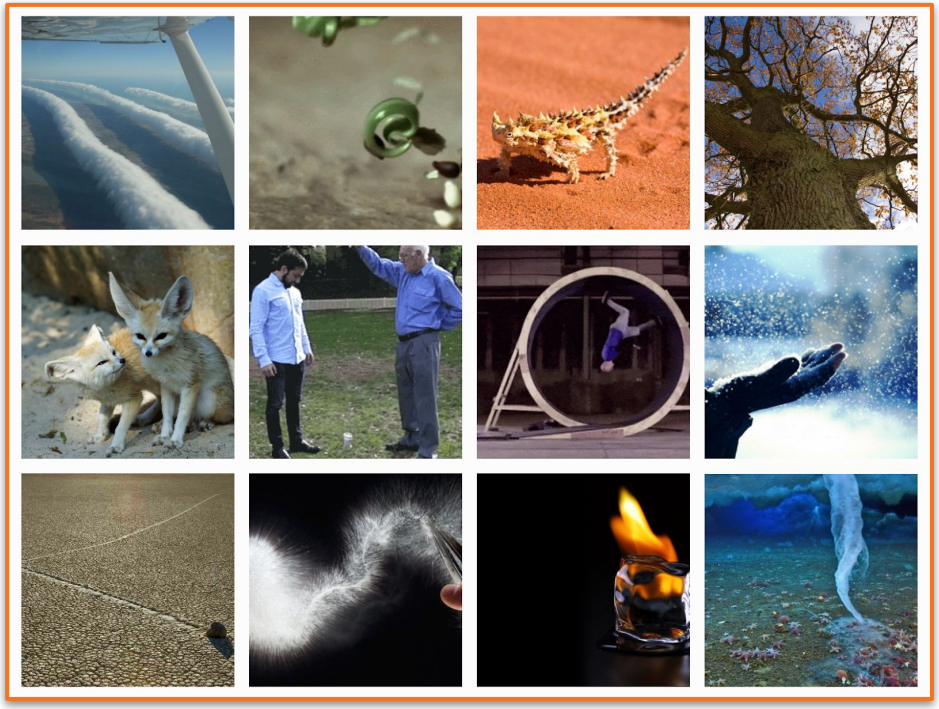


What are PHENOMENA?

Phenomena are observable occurrences.

- These occurrences stimulate curiosity or pose problems to for students to solve.

- Students are motivated to ask science questions or design solutions that drive learning.



Amplify Science units focus on phenomena

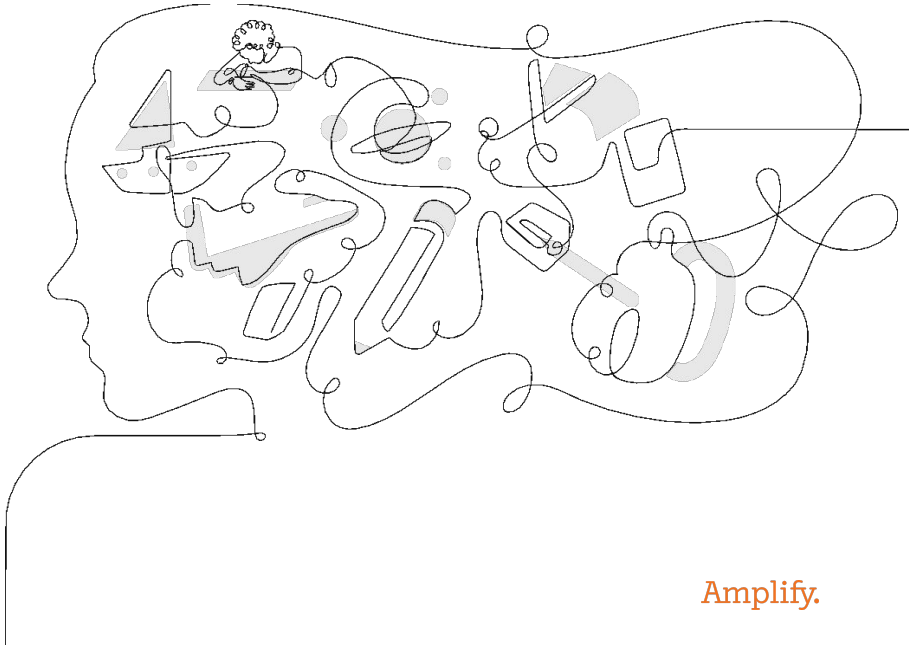
Topics	Phenomena
all about sea turtles	How do sea turtles defend themselves from sharks?
inheritance and traits	How do organisms get their traits?
ecosystem restoration	How can an ecosystem be restored to its original healthy state?

Shifts called for in the NRC* framework

Learning about topics	→	Figuring out phenomena
Listing or classifying facts devoid of context	→	Understanding interrelatedness of ideas
Simple observations	→	Complex causal explanations

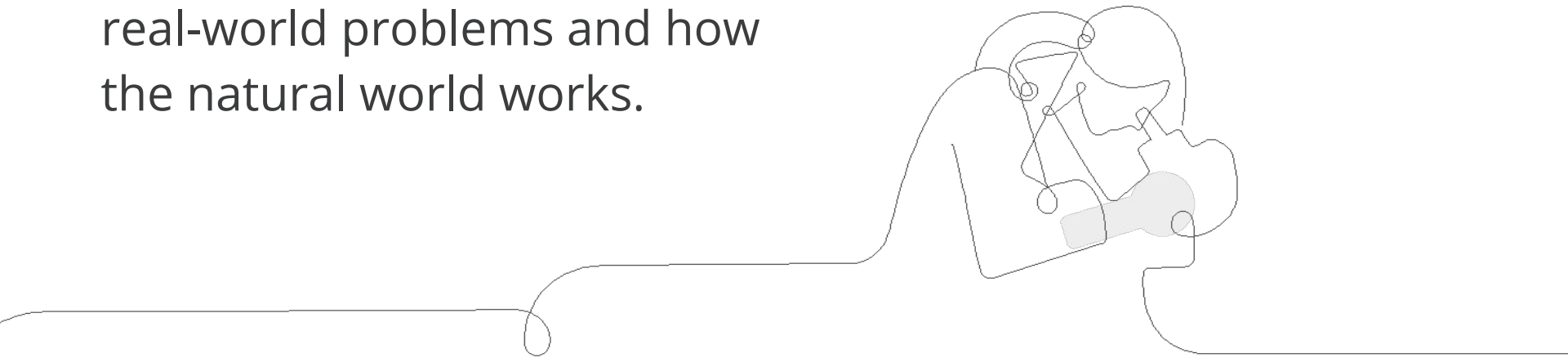
*National Research Council of the National Academy of Sciences, 2011

Figure out, not learn about

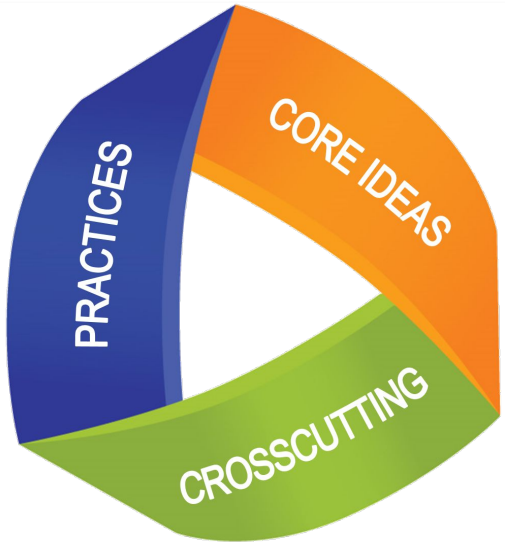


Problem-based deep dives

Students inhabit the roles of scientists and engineers to figure out solutions to real-world problems and how the natural world works.



Three dimensions of NYSSLS



Disciplinary Core Ideas

- Describe core ideas in the science discipline (DCI)

Science and Engineering Practices

- Describe behaviors scientists and engineers engage in (SEP)

Crosscutting Concepts

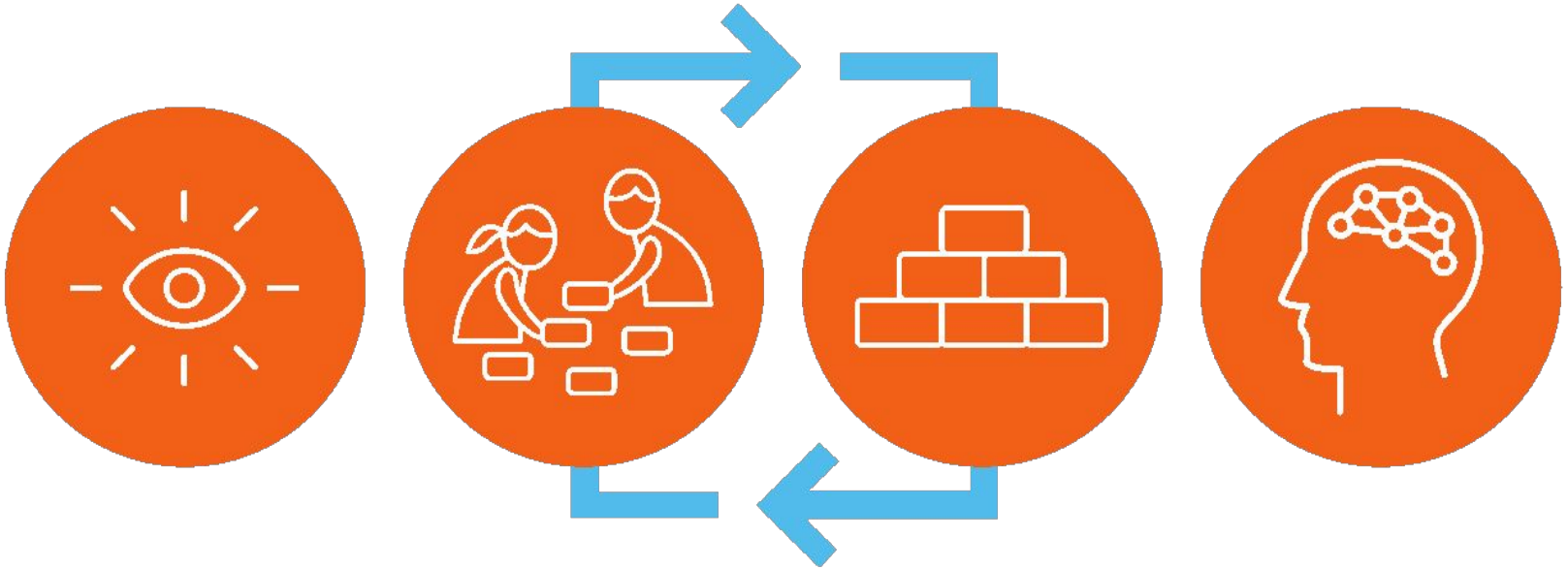
- Describe concepts linking the different domains of science (CCC)

Science and Engineering Practices (SEP)

How students engage as scientists

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Amplify Science approach



Introduce a phenomenon and a related problem

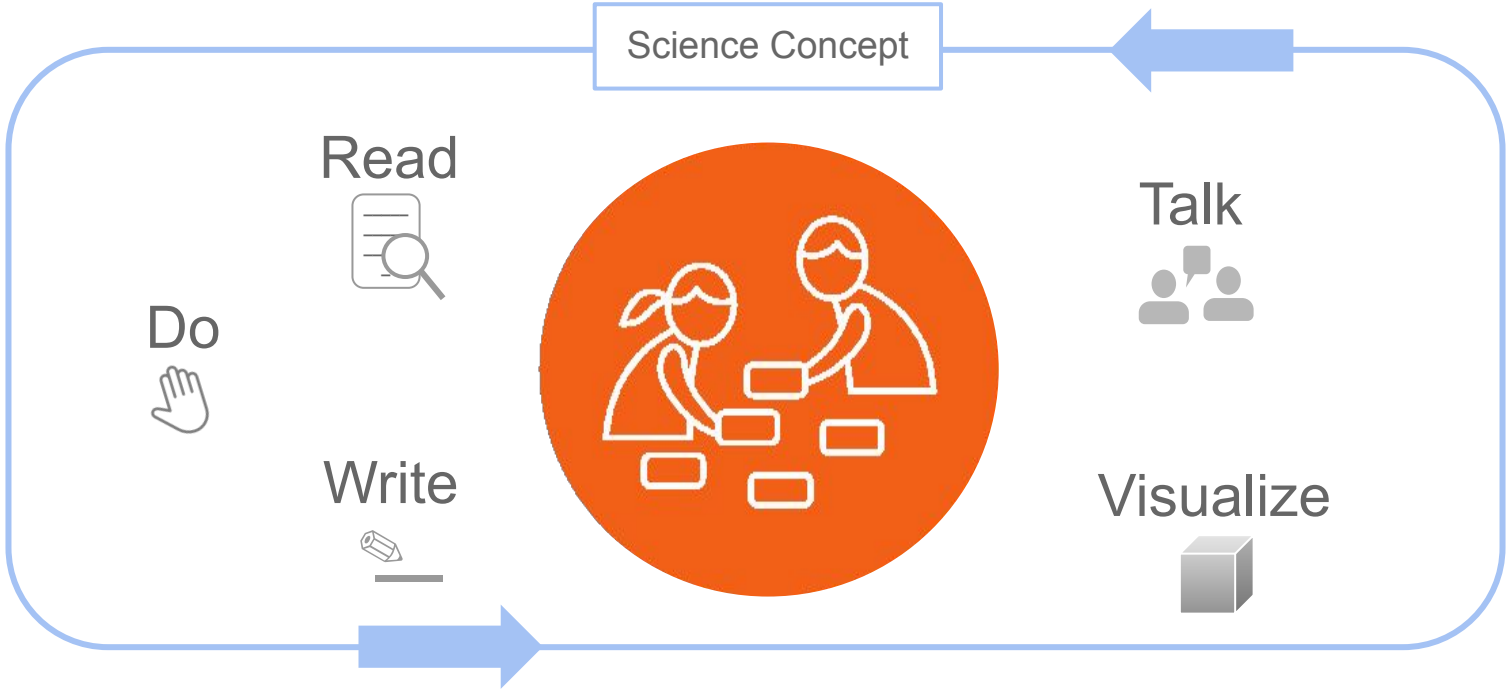
Collect evidence from multiple sources

Build increasingly complex explanations

Apply knowledge to a different context

Multimodal learning

Gathering evidence from different sources



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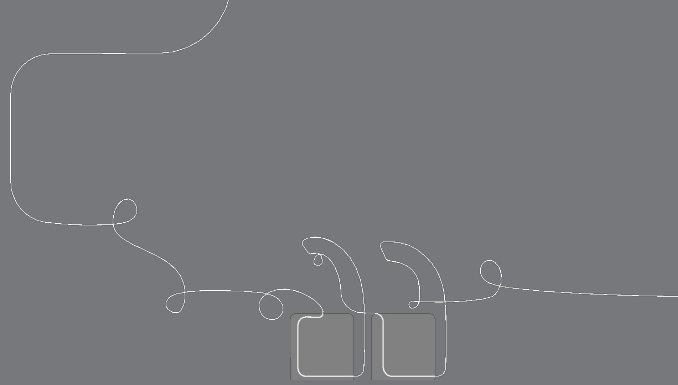
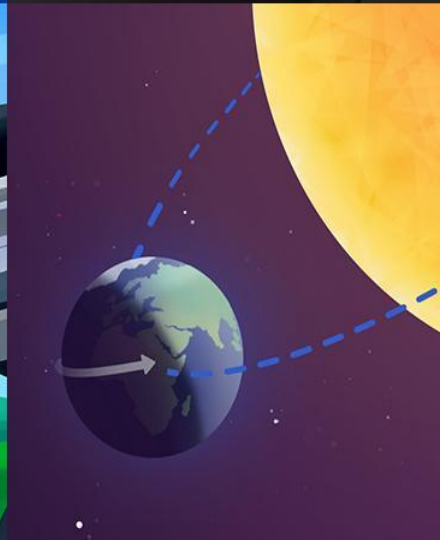


Questions?



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What is academic discourse?

Academic language

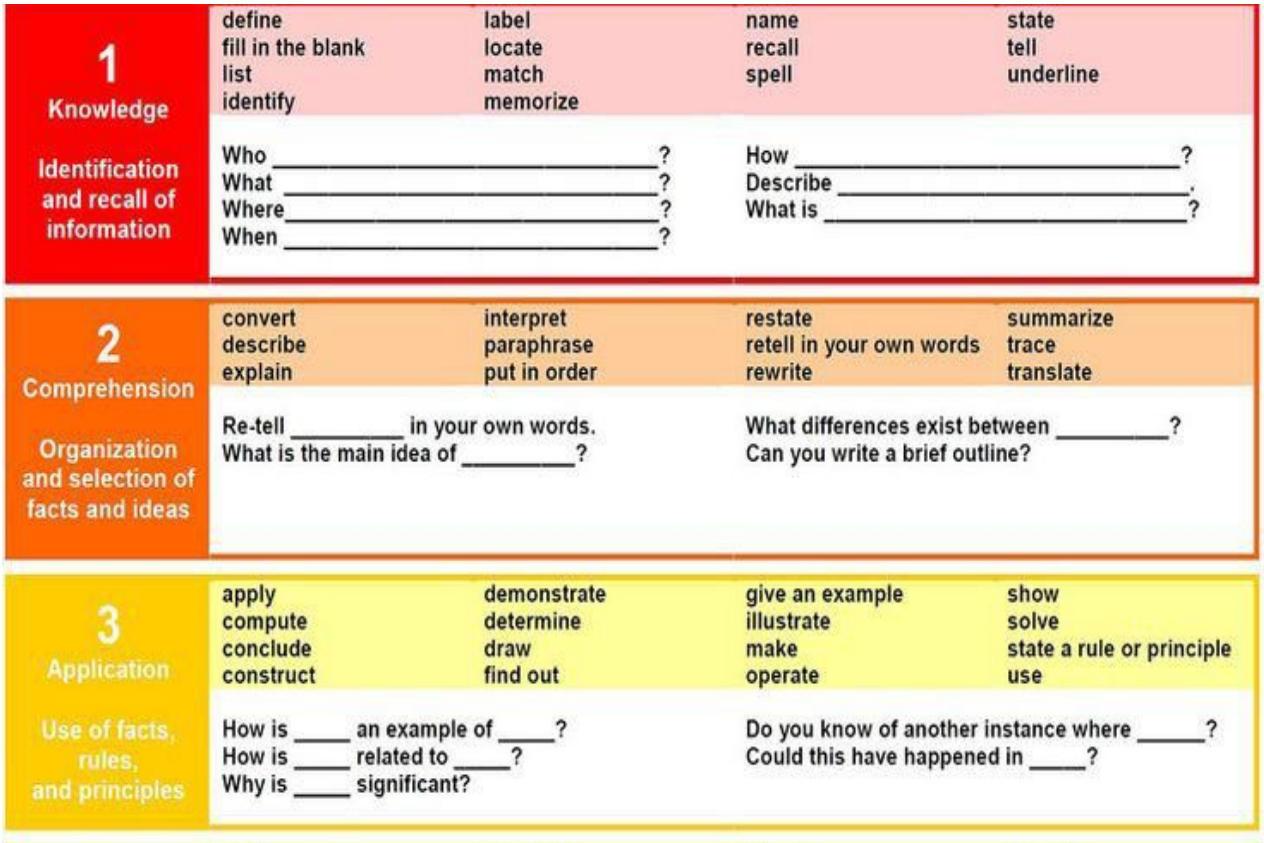
Academic discourse

- Identify…
- What is…?
- List…
- Students use tier 1 and 2 vocabulary

- Prove/disprove with evidence…
- What would happen if….how do you know?
- Explain how this connects to…
- Students use tier 2 & 3 vocabulary

How can strategic teacher questions throughout the lesson promote a higher level of student academic discourse?

Bloom's Taxonomy



1 Knowledge Identification and recall of information	define fill in the blank list identify	label locate match memorize	name recall spell	state tell underline
	Who _____? What _____? Where _____? When _____?		How _____? Describe _____. What is _____?	
2 Comprehension Organization and selection of facts and ideas	convert describe explain	interpret paraphrase put in order	restate retell in your own words rewrite	summarize trace translate
	Re-tell _____ in your own words. What is the main idea of _____?		What differences exist between _____? Can you write a brief outline?	
3 Application Use of facts, rules, and principles	apply compute conclude construct	demonstrate determine draw find out	give an example illustrate make operate	show solve state a rule or principle use
	How is _____ an example of _____? How is _____ related to _____? Why is _____ significant?		Do you know of another instance where _____? Could this have happened in _____?	

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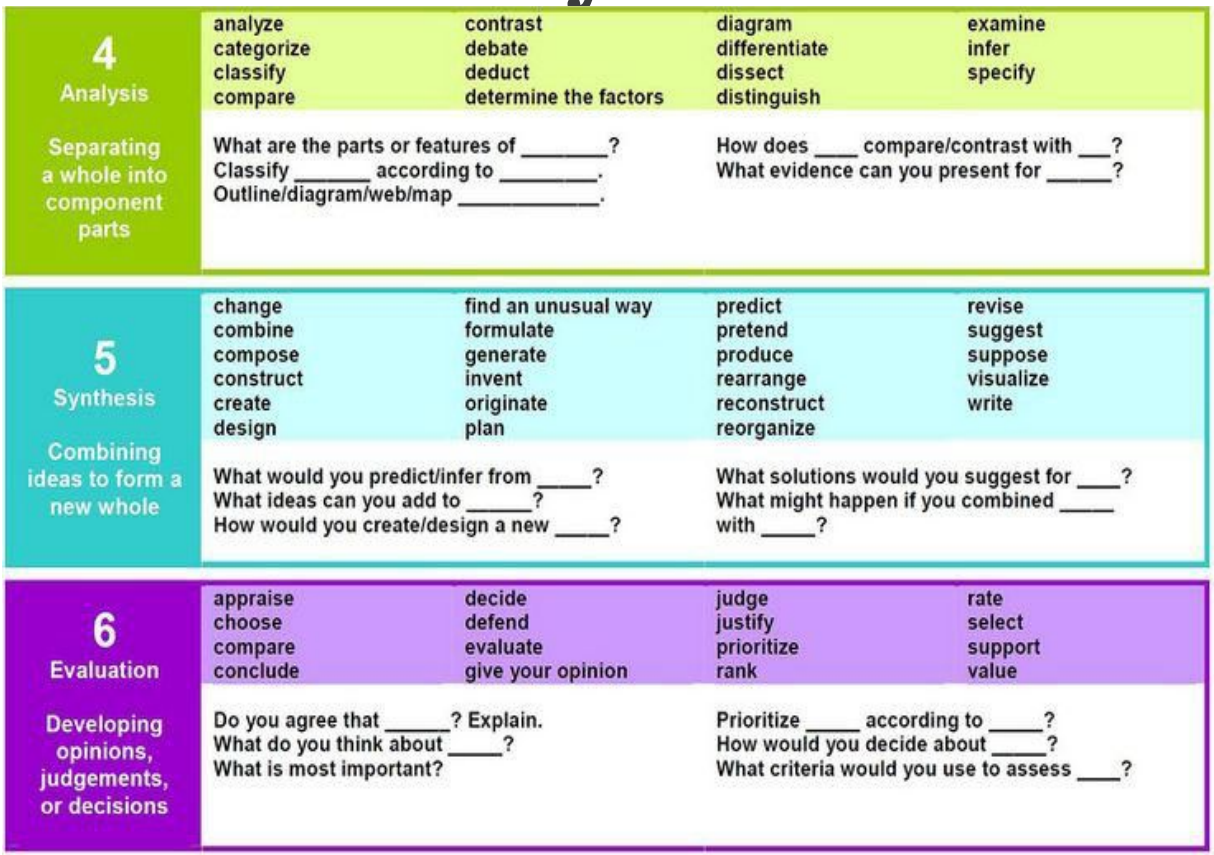
From https://www.teachthought.com/learning-models/25-question-stems-framed-around-blooms-taxonomy

Bloom's Taxonomy



4 Analysis Separating a whole into component parts	analyze categorize classify compare	contrast debate deduct determine the factors	diagram differentiate dissect distinguish	examine infer specify
	What are the parts or features of _____? Classify _____ according to _____. Outline/diagram/web/map _____.		How does ____ compare/contrast with ___? What evidence can you present for _____?	
5 Synthesis Combining ideas to form a new whole	change combine compose construct create design	find an unusual way formulate generate invent originate plan	predict pretend produce rearrange reconstruct reorganize	revise suggest suppose visualize write
	What would you predict/infer from _____? What ideas can you add to _____? How would you create/design a new _____?		What solutions would you suggest for ____? What might happen if you combined _____ with _____?	
6 Evaluation Developing opinions, judgements, or decisions	appraise choose compare conclude	decide defend evaluate give your opinion	judge justify prioritize rank	rate select support value
	Do you agree that _____? Explain. What do you think about _____? What is most important?		Prioritize _____ according to _____? How would you decide about _____? What criteria would you use to assess ____?	

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From https://www.teachthought.com/learning-models/25-question-stems-framed-around-blooms-taxonomy/

Amplify Science discourse routines

- Oral Composition and/or Drawings as teacher captures words (K-1)
- Explanation Language Frames
- Shared Listening
- Partner Reading
- Thought Swap
- Think-Pair-Share
- Word Relationships
- Questioning Strategies [K-8]
    - Do you agree/disagree?

	Kindergarten - Grade 1	Grades 2-5
Discourse routines	Students engage in informal partner, small group, and full class talk as well as with Shared Listening, a structured discourse routine. To work towards answering each Chapter question, students first compose responses orally with a Language Frame activity using sentence frames written on sentence strips, completed with cards. They use this practiced sentence structure to write explanations together as a class (Shared Writing) or in their investigation notebooks.	Students engage in informal partner, small group, and full class talk as well as with a variety of structured discourse routines. Each unit includes 2-3 different routines such as: • Shared listening • Think-pair-share • Think-draw (or write) -pair-share • Thought swap • Concept mapping • Word relationships • Building on ideas • Evidence circles

Vision and Light

@Home Lesson 2

AmplifyScience

Conservation Biologists

Tokay Gecko

You are working as **conservation biologists** to help the Rain Forest Conservation Group figure out why the **Tokay geckos** are having trouble surviving.

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Now, we are going to investigate this question:

How do animals use their senses to get information about their environment?

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Today, we will explore how you use your **senses** to get **information** from your **environment**.

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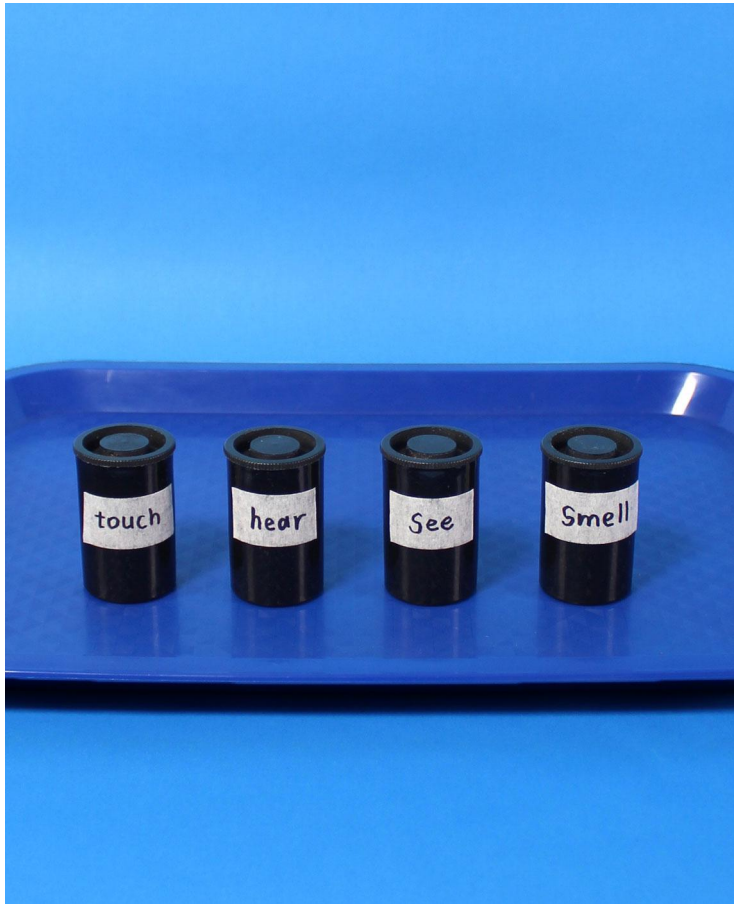

Some students **observed** objects in these containers.

The labels told them which **sense** to use to observe each object.

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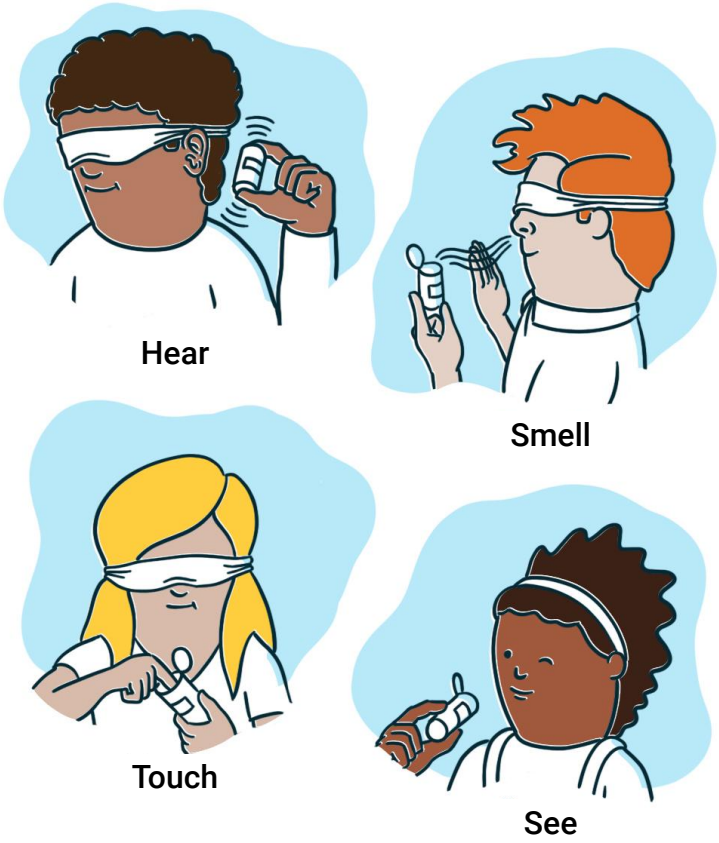

As they observed the containers, the students paid close attention to **what** information they got from their environment and **how** that information got to them.

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For example, if we **observe** an eraser with our eyes, we get information about it.

The **information** we get with our **vision** is that this object is **pink, rectangular, and solid.**

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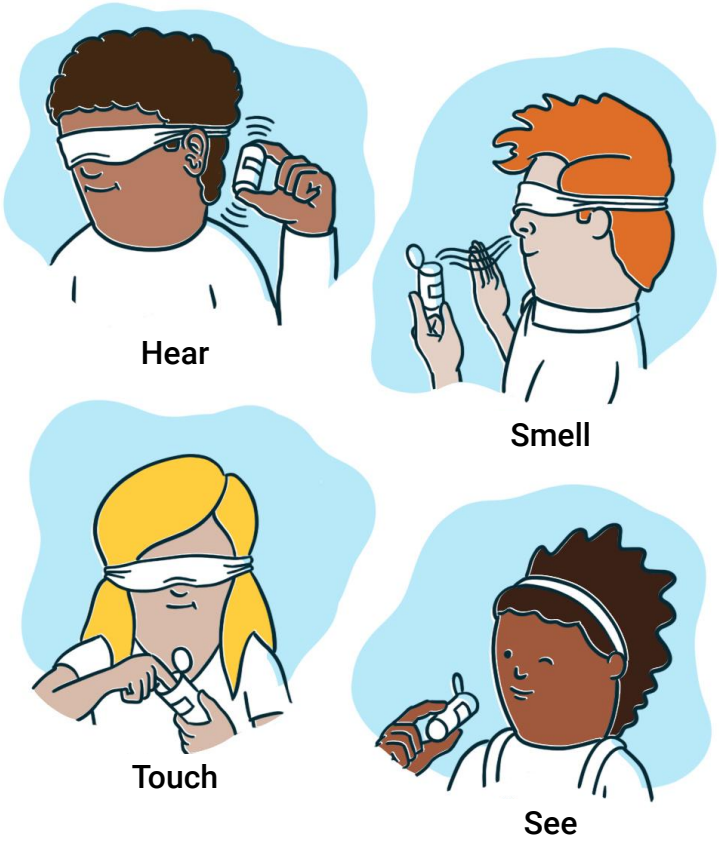

Let's watch a video of the students **observing** the containers and using their senses to get information.

Observe **how** the students **use their senses** to get information. Then, make a guess about what is inside each container.

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tinyurl.com/AMPVAL-01

Name: _____ Date: _____

Getting Information About the Environment

Directions:

1. Find the box for Container 1.
2. Circle the sense that the students used to get information about the object in that container.
3. Write what information the students got about the object.
4. Repeat Steps 1–3 for Containers 2, 3, and 4.

Container 1	**Container 2**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____
Container 3	**Container 4**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____

Vision and Light @Home Lesson 2

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Find the Getting Information About the Environment page.

Use the next slides to help you record what happened when students investigated each container. You can also watch the video again.

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Smell

Name: _____ Date: _____

Getting Information About the Environment

Directions:

1. Find the box for Container 1.
2. Circle the sense that the students used to get information about the object in that container.
3. Write what information the students got about the object.
4. Repeat Steps 1–3 for Containers 2, 3, and 4.

Container 1	**Container 2**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____
Container 3	**Container 4**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____

Vision and Light @Home Lesson 2

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When the students used their sense of smell, they observed that the object smelled spicy and had a strong scent.

What did you **guess** that the object was?

Complete the section for **Container 1**.

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Hear

ame: _____ Date: _____

Getting Information About the Environment

Directions:

1. Find the box for Container 1.
2. Circle the sense that the students used to get information about the object in that container.
3. Write what information the students got about the object.
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Container 3	**Container 4**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____

Vision and Light @Home Lesson 2

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When the students used their sense of hearing, they observed that the object sounded noisy and solid, and that there was more than one object.

What did you **guess** that the object was?

Complete the section for **Container 2**.

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See

Name: _____ Date: _____

Getting Information About the Environment

Directions:

1. Find the box for Container 1.
2. Circle the sense that the students used to get information about the object in that container.
3. Write what information the students got about the object.
4. Repeat Steps 1–3 for Containers 2, 3, and 4.

Container 1	**Container 2**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____
Container 3	**Container 4**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____

Vision and Light @Home Lesson 2

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When the students used their sense of sight, they observed that the object looked white, square-shaped, and had black dots.

What did you **guess** that the object was?

Complete the section for **Container 3**.

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Touch

Name: _____ Date: _____

Getting Information About the Environment

Directions:

1. Find the box for Container 1.
2. Circle the sense that the students used to get information about the object in that container.
3. Write what information the students got about the object.
4. Repeat Steps 1–3 for Containers 2, 3, and 4.

Container 1	**Container 2**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____
Container 3	**Container 4**
What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____	What sense did the students use to get information about the object? hear touch smell see What information did the students get about the object? _____ _____

Vision and Light @Home Lesson 2

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When the students used their sense of touch, they observed that the object felt fuzzy and soft.

What did you **guess** that the object was?

Complete the section for **Container 4**.

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What kind of **information** did the students get about what was in each container?

How did the students **get information** about each of the objects in the containers?

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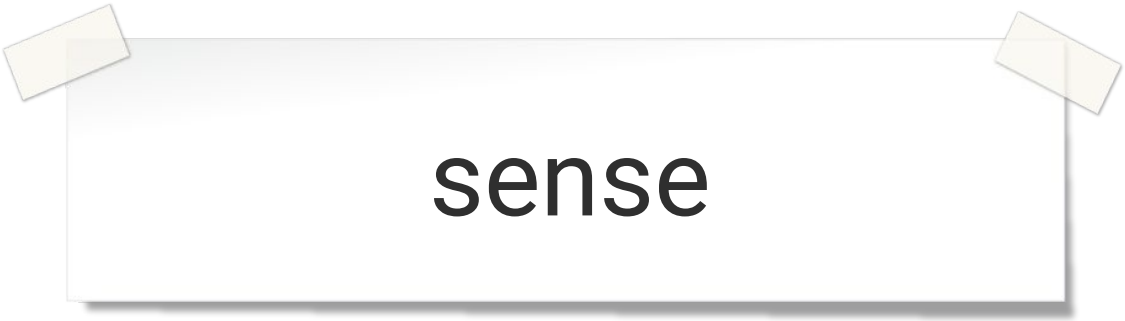
The students used their **senses**, such as sight, hearing, smell, and touch, to observe the containers.



how an animal gets information from its environment

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We'll look at some photos showing how other animals use their **senses** to get **information** from the **environment**.

To help us think about how the animals use their bodies to get information, first we'll think about two important **science words**.

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structure

the way something is shaped or what it is made out of that makes it good for a specific function

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function

what something can do

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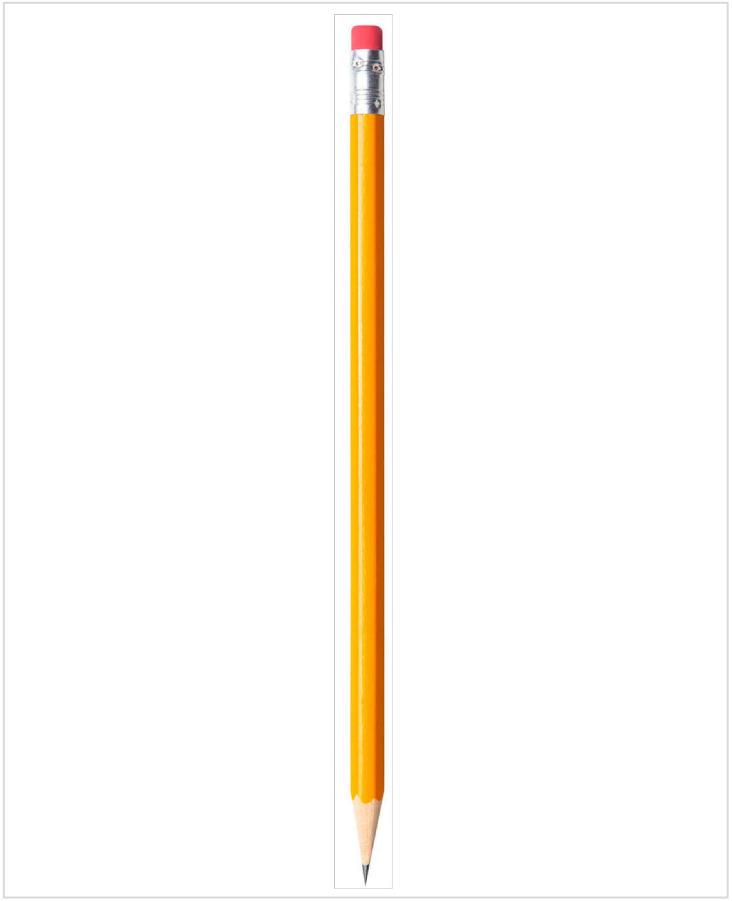

Let's use a pencil as an example to think about these words.

A pencil's long, thin, and pointy **structure** makes it good for writing. The **function** of a pencil is to write things.

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When you look at the photos of animals, you should think about what the body **structure** in each image has to do with how the animal gets **information** from its environment.

You will need a **partner** to talk with.

Your partner can be a family member, a friend or classmate on the phone, a stuffed animal, or even a pet!

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What is this?

What is its **function**?
What is it used for?

How does the **structure** of this nose make it good for its **function**?

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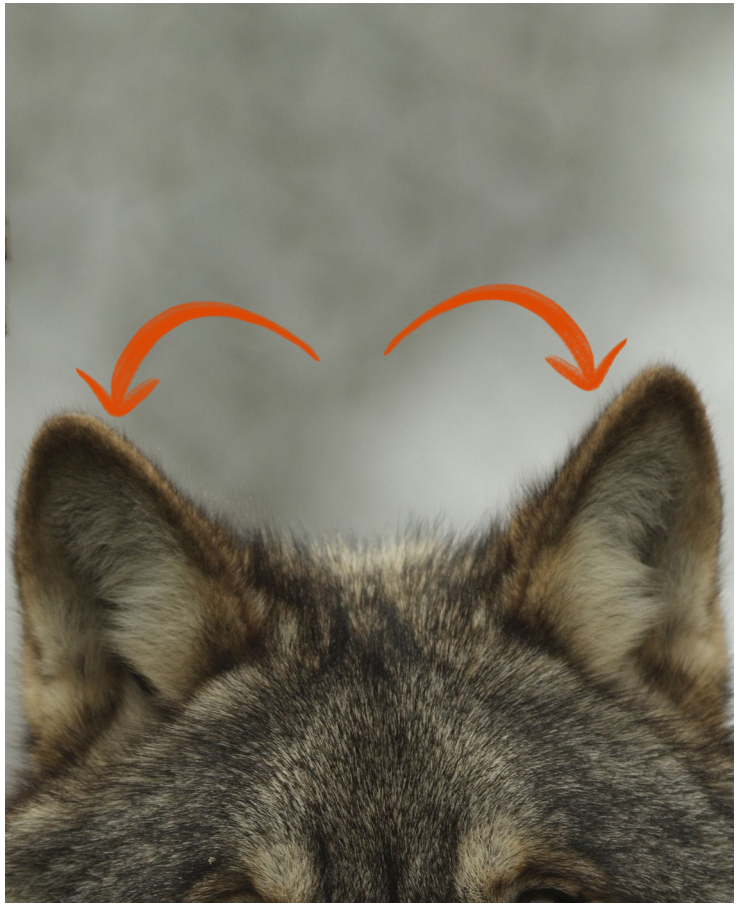

What are these?

What is their **function**?
What are they used for?

How does the **structure** of these ears make them good for their **function**?

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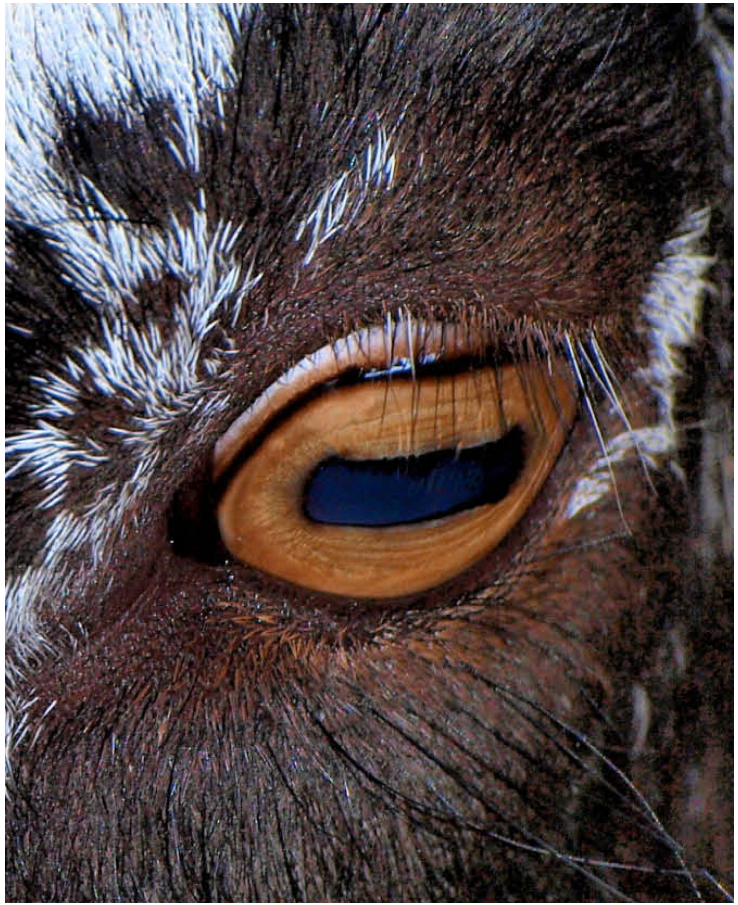

What is this?

What is its **function**?
What is it used for?

How does the **structure** of this eye make it good for its **function**?

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What are these?

What is their **function**?
What are they used for?

How does the **structure** of these whiskers make them good for their **function**?

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Think back to the activity where you observed students using their senses.

What **structures** did the students use to get **information** about the objects in the containers?

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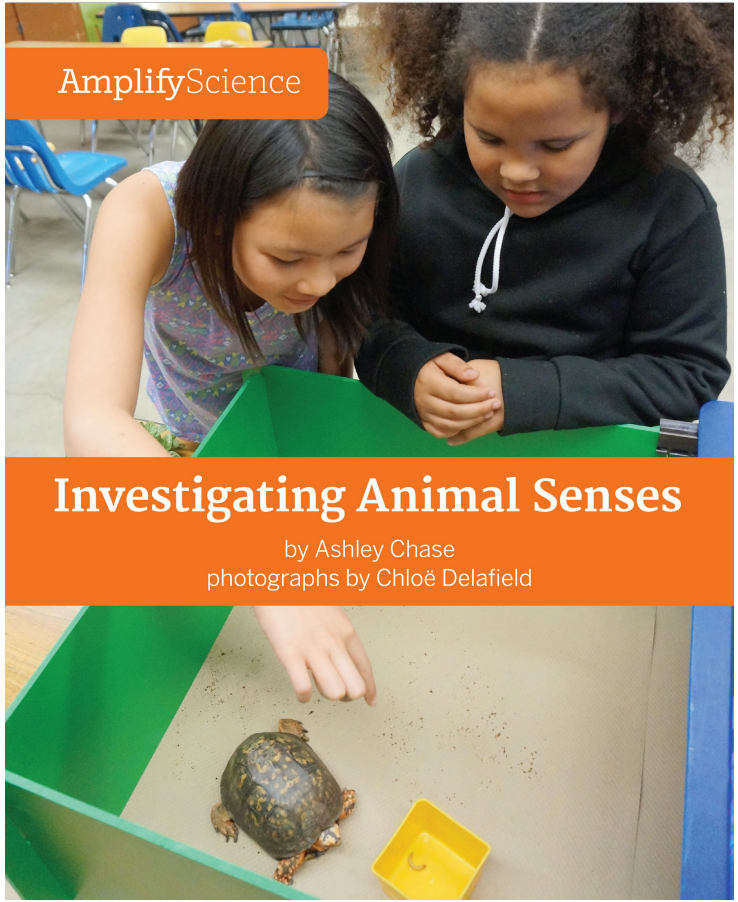

All kinds of people use science to figure things out.

We will read a book about fifth graders who **investigate** how animals use their **senses** to get **information** from their environment.

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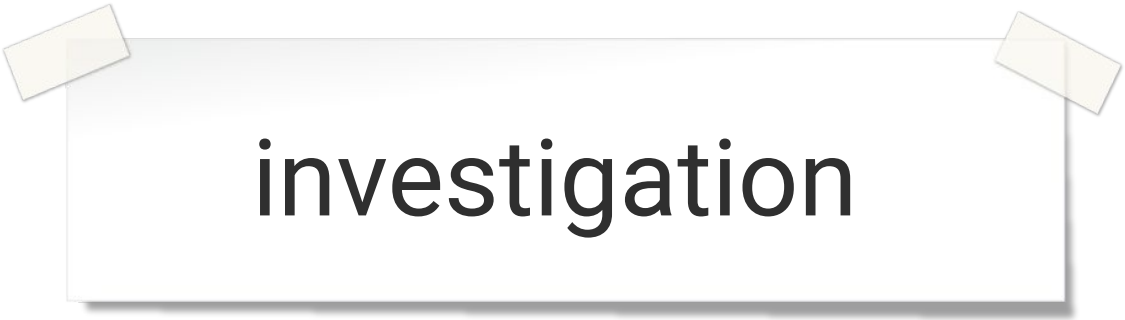
The students in the book will do an **investigation** to find out about animal senses.



an attempt to find out about something

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Reading science texts can be hard. A good way to focus on important ideas is to ask yourself **questions** while you read.

Scientists do this to help them **pay attention** to the topic they want to learn about and to make sure they **understand** what they read.

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Check with your teacher about how you will access books in this @Home Unit.

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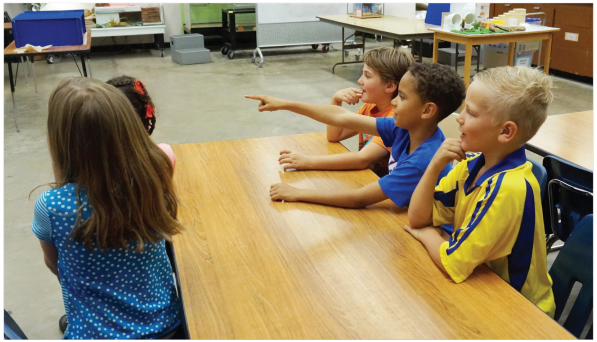
Real Animals?

The fifth-grade class arrived at the science center. The students were excited to see the exhibits, and their teacher had told them they would also be taking a class on animal **senses**.

They lined up and filed into the Animal Discovery Room, which had shelves with many glass boxes holding lizards, snakes, and other animals. On tables in the back of the room were four big wooden boxes with closed lids, so nobody could see what was inside. The students were definitely curious about what might be in there.



4

Turn to page 4 in *Investigating Animal Senses*. Read the first paragraph.

One question you might have after reading this paragraph is: **Do other animals have the same five senses that we have?**

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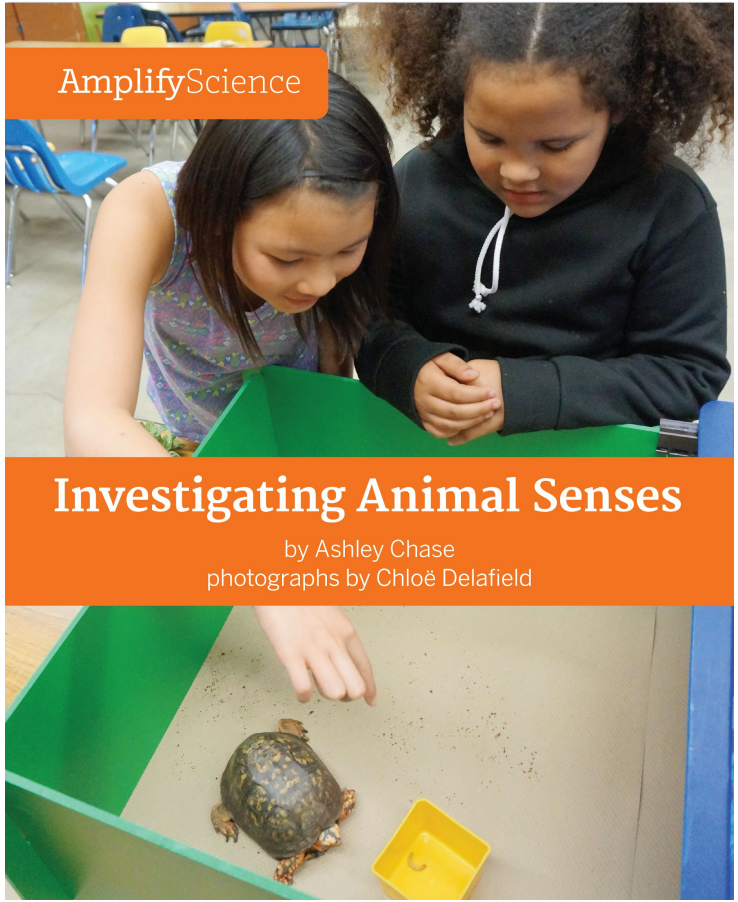

Read the rest of the book.

Think about any questions you have as you read.

You can access a digital version of the book here, or watch a video read-aloud at tinyurl.com/AMPVAL-23

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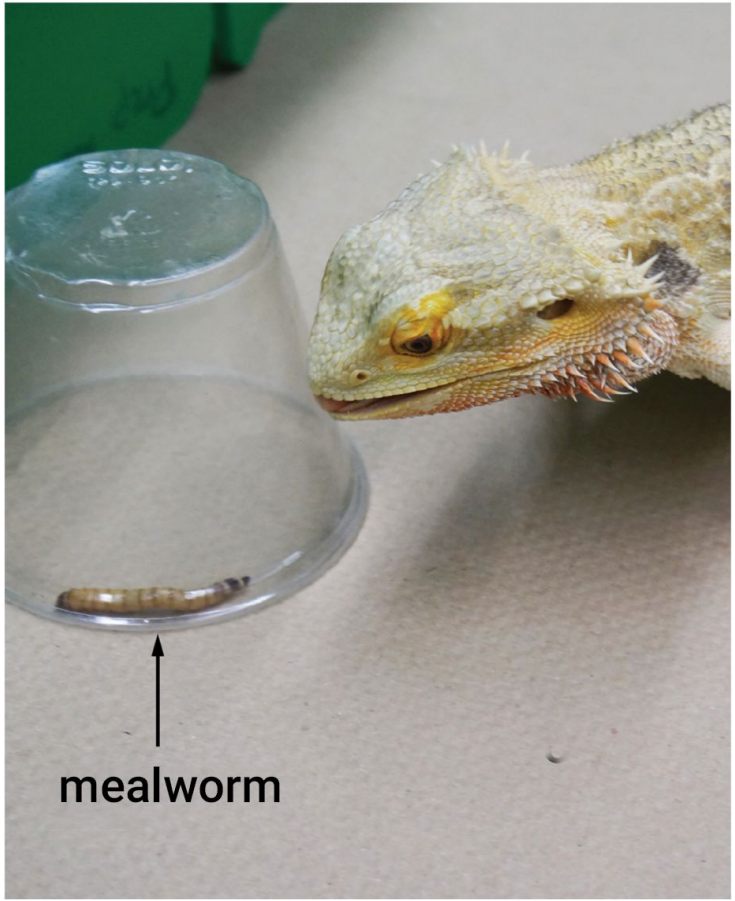

In the book, we observed a lizard getting information about its environment by using its vision to see a mealworm.

What **information** could the lizard still get about the mealworm when the cup was placed on top?

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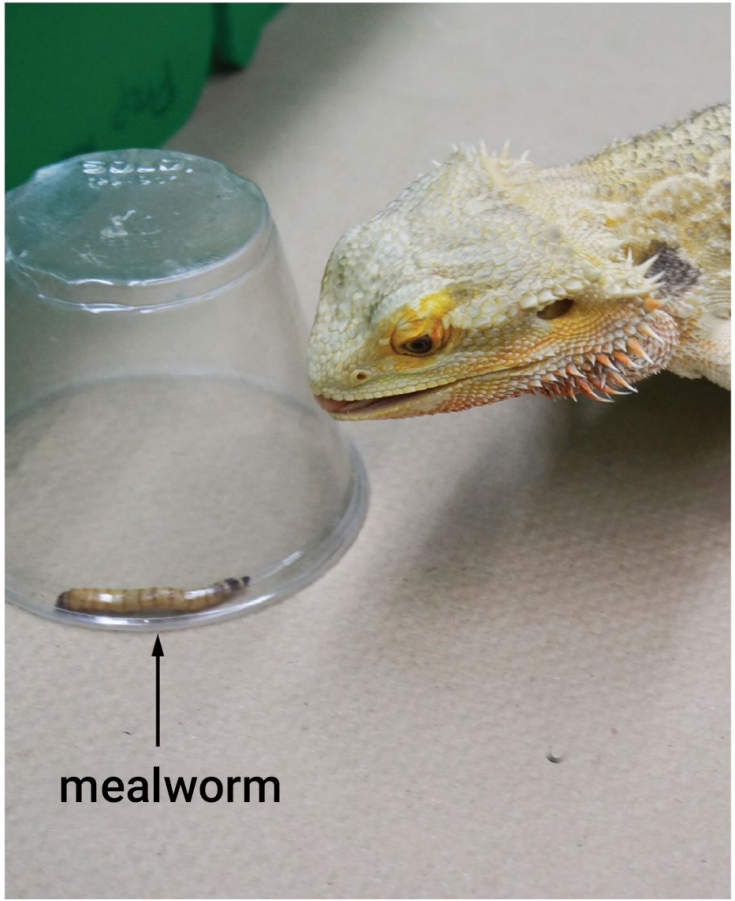

What **information** about the mealworm was **blocked** when the cup was placed on top?

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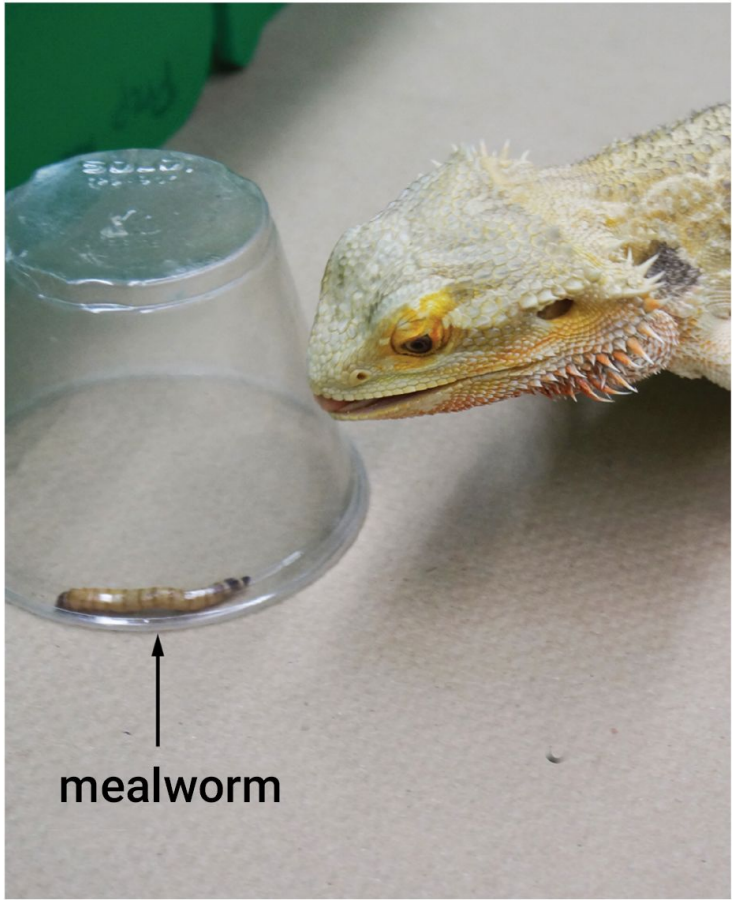

You probably noticed that the lizard can use its senses to gather information only when there is not something blocking that information from getting to it.

The lizard could not smell the mealworm because the cup **blocked the smell.**

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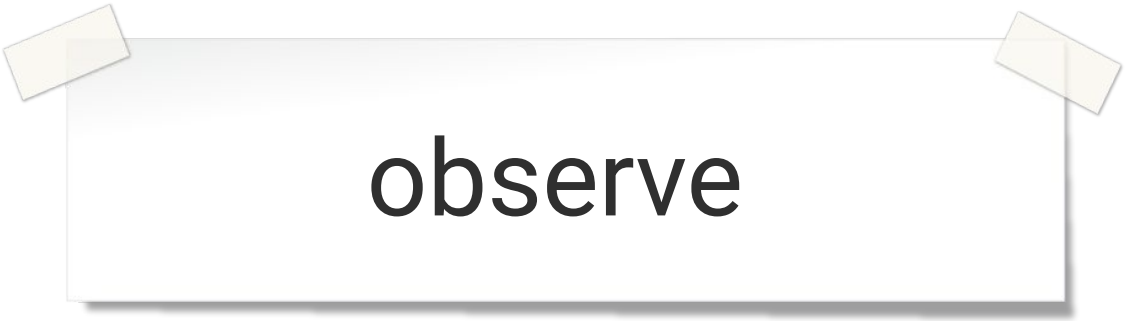
We have been using and reading the word **observe.**



to use any of the five senses to gather information about something

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End of @Home Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Amplify.

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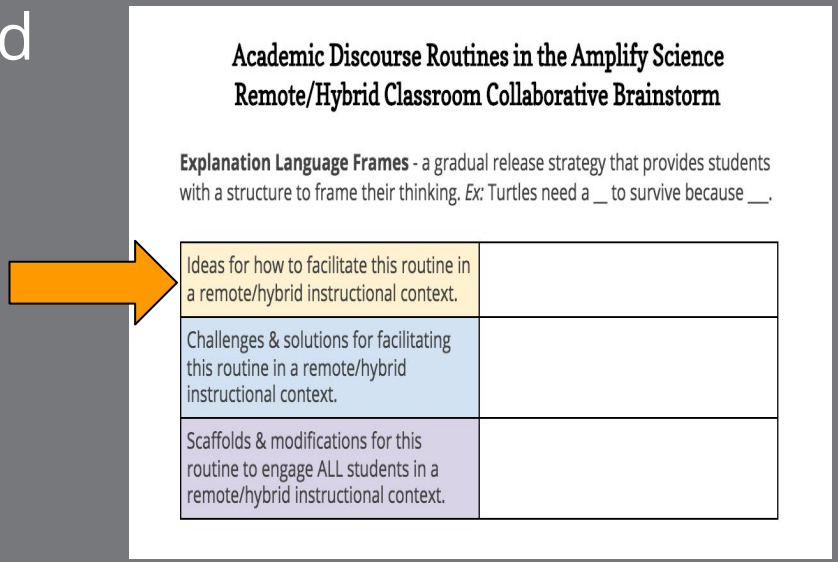
Reflect and share

- Choose one discourse routine and describe how you would facilitate it in your remote/hybrid classroom for this particular lesson.



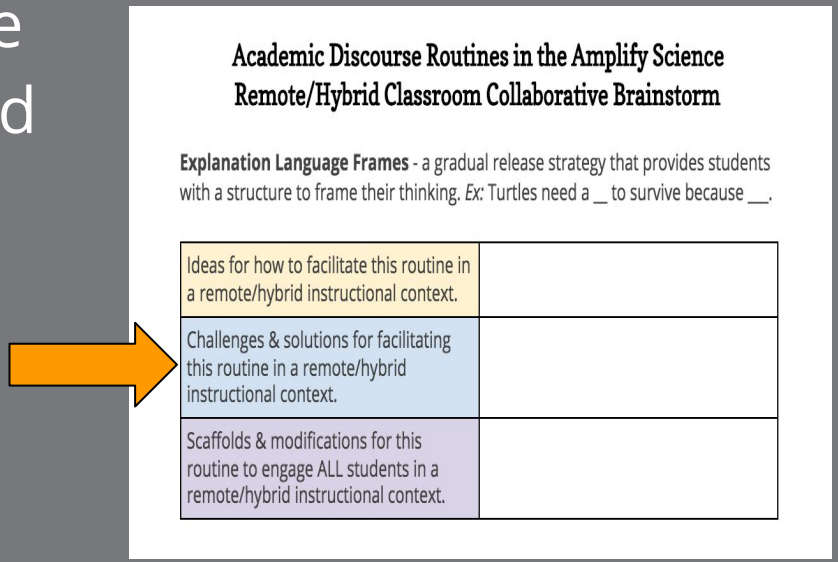
Academic Discourse Routines in the Amplify Science Remote/Hybrid Classroom Collaborative Brainstorm

Explanation Language Frames - a gradual release strategy that provides students with a structure to frame their thinking. *Ex:* Turtles need a __ to survive because ___.

Ideas for how to facilitate this routine in a remote/hybrid instructional context.	
Challenges & solutions for facilitating this routine in a remote/hybrid instructional context.	
Scaffolds & modifications for this routine to engage ALL students in a remote/hybrid instructional context.	

Reflect and share

- What might be one challenge with facilitating this discourse routine in your remote/hybrid classroom?
- What is a solution to this challenge?



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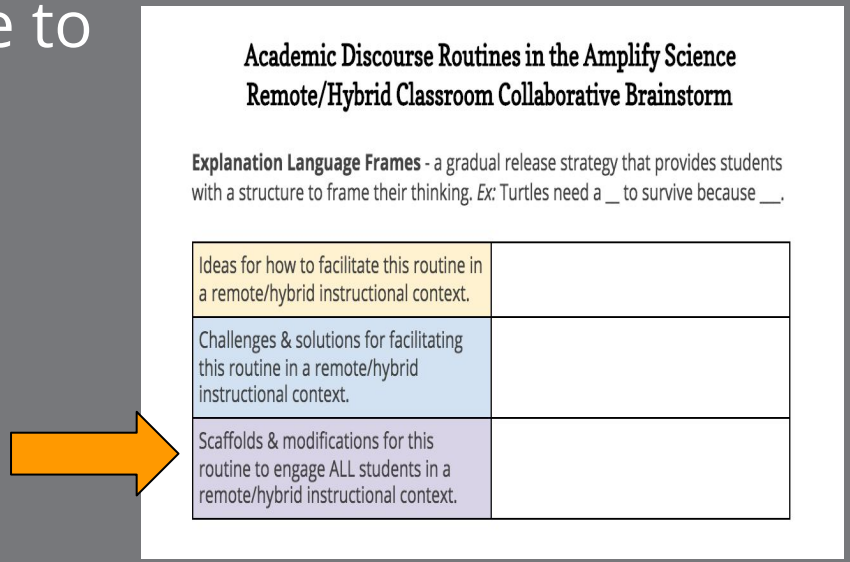
Scaffolds & modifications for this routine to engage ALL students in a remote/hybrid instructional context.	

Reflect and share

- How could you scaffold and/or modify the discourse routine to engage all students?



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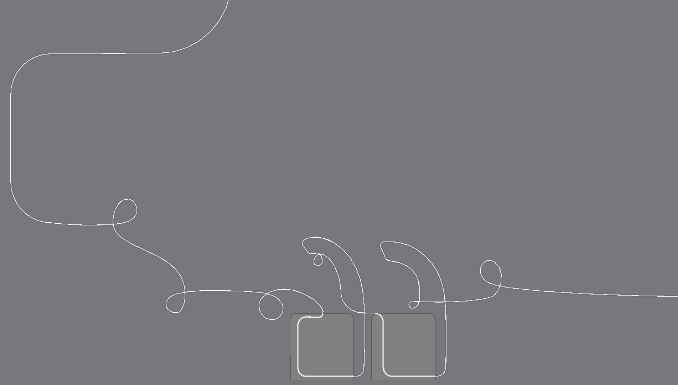
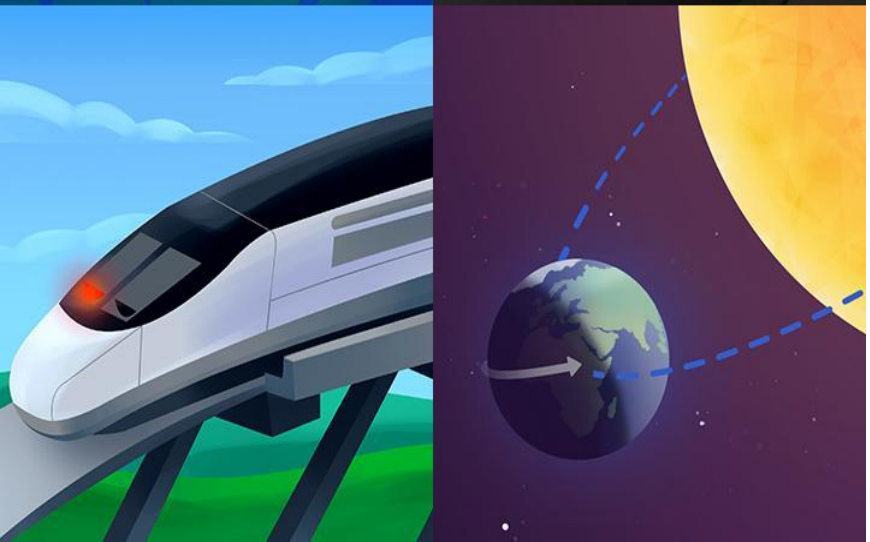


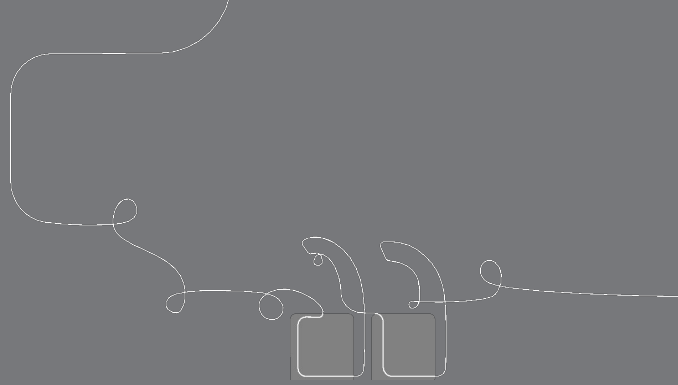
Questions?



Plan for the day

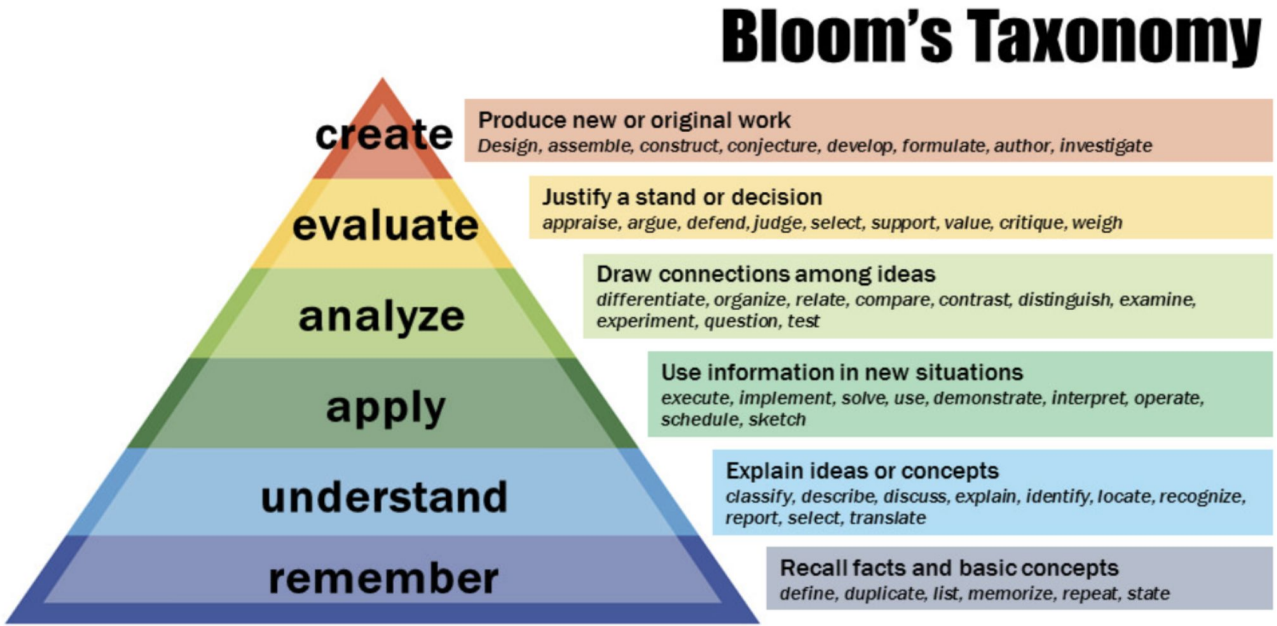
- **Framing the day**
  - Welcome and introductions
  - Anticipatory activity
- **Amplify Science approach review**
  - Multimodal, phenomenon-based learning
  - 3-dimensional learning
- **Amplify Science discourse routines**
  - @Home Unit lesson analysis
- **Questioning strategies**
  - Remote/hybrid adaptations
- **Classroom wall**
  - Unit, chapter, & investigation questions
  - Remote classroom wall
- **Closing**
  - Reflection & additional resources
  - Survey

Reflect and share



- What questioning strategies have you used in your classroom in the past?
- What role(s) have these strategies taken on in your classroom in the past?

Questioning Strategies - In order to engage all learners in the classroom, ensuring everyone has the opportunity to participate in discussions and do the important thinking when a question is posed, teachers use a variety of questioning strategies along Bloom's Taxonomy. Questions are pre-planned prior to the lesson and specifically aligned to the learning objectives and differentiated student needs.

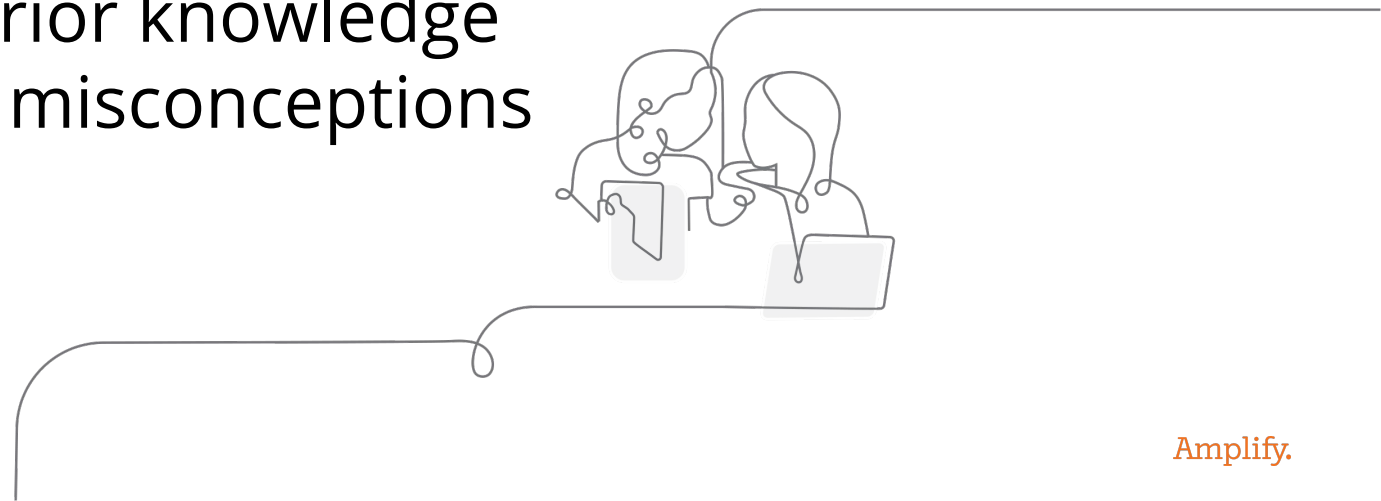


To make connections within a unit of study, ask students to:

- **Remember:** What are we figuring out in this unit? What do you already know?
- **Understand:** Describe how this lesson activity is connected to the unit/chapter/investigation question?
- **Apply:** Use the unit vocabulary to enhance your scientific explanation.
- **Analyze:** What information can you use from the Simulation to support your explanation or argument? Describe how the ideas / concepts fit together?
- **Evaluate:** Defend your claim with at least two sources of evidence. Critique the argument of a peer and provide feedback on their supporting evidence.
- **Create:** Design a model to support the solution.

Questioning in Amplify Science

- clarify understanding
- justify claims
- verify evidence
- accessing prior knowledge
- uncovering misconceptions

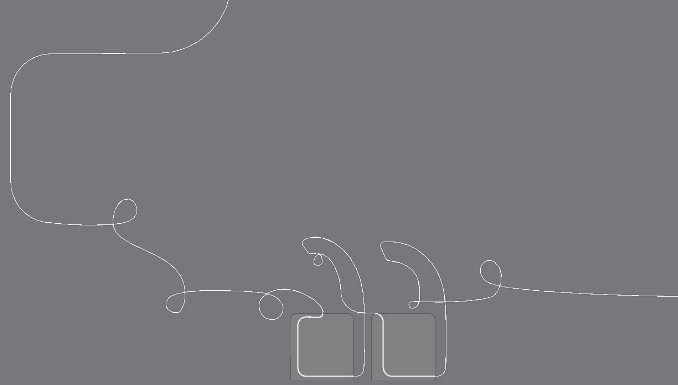


Analyzing Questioning Strategies in Amplify

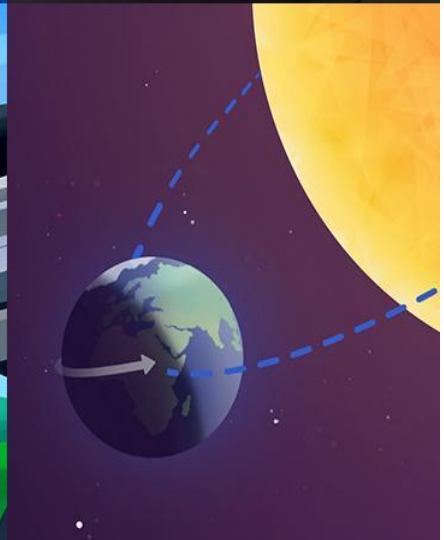
Use the graphic organizer to collect your thoughts.

- Identify questions within @home lesson of choice.
- What purpose did the questions serve?
- How did the questions further student understanding?
- How did they serve as a check for understanding?
- How did they align to the unit phenomenon?
- What modifications would you make to questioning to address the needs of the different learners in a remote/hybrid context?

Identify questions within the activity.	
What purpose did the questions serve?	
How did the questions further student understanding?	
How did they serve as a check for understanding?	
How did they align to the unit phenomenon?	
Thinking about your students, what modifications would you make to questioning to address their needs?	



Questions?



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Vision and Light: Investigating Animal Eyes

Problem students work to solve	Why is an increase in light affecting the health of Tokay geckos in a Philippine rain forest?
Chapter 1 Question	How does a Tokay gecko get information about its environment?
Investigation Question	…1.4)
Evidence sources and reflection opportunities	…nt (1.2) …gh a full-class
Key concepts	…vironment. (1.3) …vironment, which helps …al. (1.4) (Revised from 1.3)
Application of key concepts to problem	• Write about how animals get information from their environment (1.4) • Discuss how a Tokay gecko gets information about its environment (1.4)
Explanation that students can make to answer the Chapter 1 Question	In order to survive, a gecko must avoid predators and find prey. To do this, geckos use structures to get information from their environment. For instance, a gecko uses its ears to hear if there is a predator nearby and its vision to watch for predators.

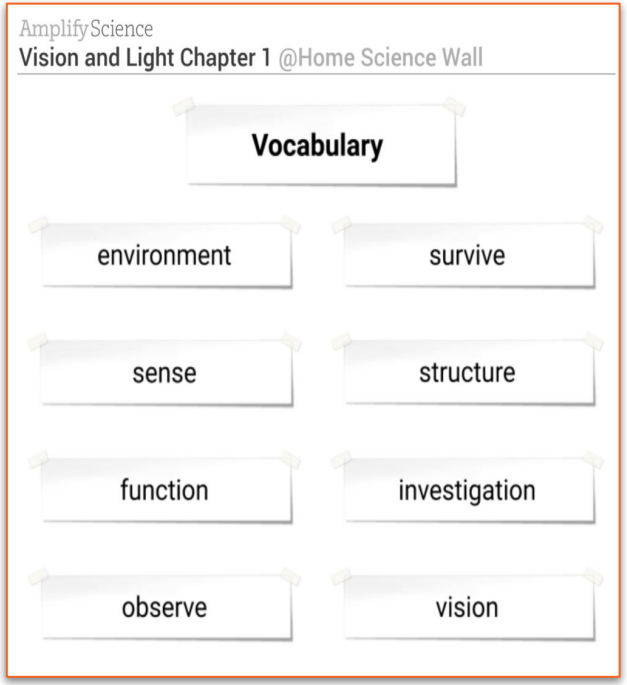
What is the relationship among unit, chapter, and investigation questions?

How do they facilitate students' thinking like a scientist and/or engineer?

Classroom wall

Re-imagined as @Home science wall

- **Chapter Questions**, **key concepts**, and **vocabulary** that have been introduced so far are provided in the **last lesson** of each chapter.
- How would you enhance students' experience of the **Classroom wall** in a **remote/hybrid** setting?



@Home science wall

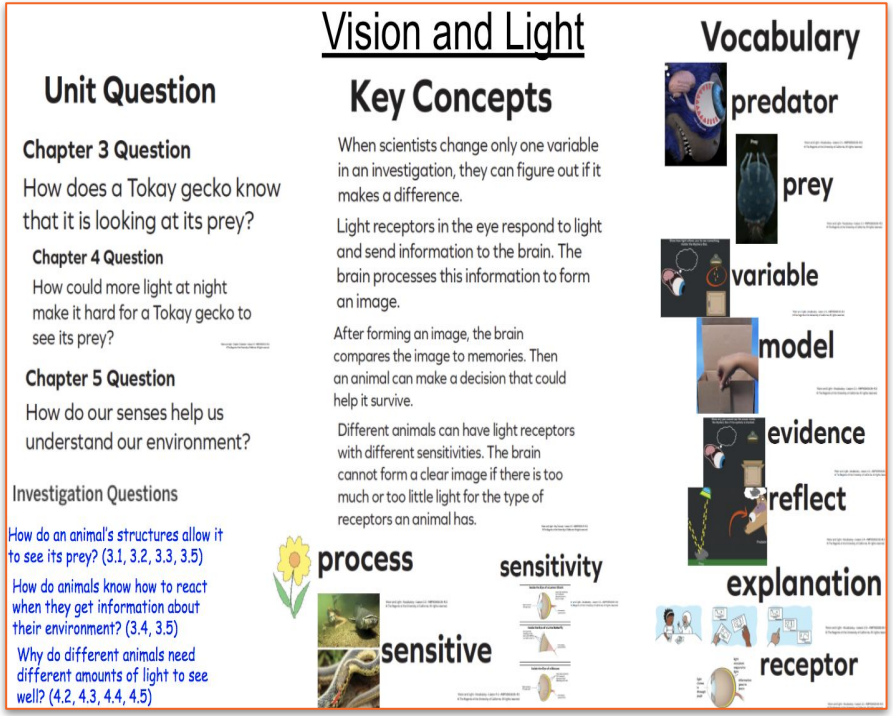
To enhance students' experience of the @Home Science Wall, you could have them:

- Draw a **picture** or write their ideas on their @Home Science Wall pages.
- Highlight or **color** in each question, key concept, or word that is introduced.
- **Cut out** each question, key concept, or word. These can be then posted on a wall, large sheet of paper, or refrigerator at home.
- **Illustrate** each word that is introduced to create a picture glossary.
- If you are meeting with your class remotely, you could create a **virtual** @Home Science **Wall.**

Creating a virtual @Home science wall

If meeting remotely

- **Screenshot** chapter questions, key concepts, vocabulary from **@Home Student sheets**
- Screenshot (from **teacher's guide**) or create own **unit** & **investigation** questions
- **Animate** new additions
- Now **try** yourself on **Google slides**!



Vision and Light

Unit Question

Chapter 3 Question

How does a Tokay gecko know that it is looking at its prey?

Chapter 4 Question

How could more light at night make it hard for a Tokay gecko to see its prey?

Chapter 5 Question

How do our senses help us understand our environment?

Investigation Questions

How do an animal's structures allow it to see its prey? (3.1, 3.2, 3.3, 3.5)

How do animals know how to react when they get information about their environment? (3.4, 3.5)

Why do different animals need different amounts of light to see well? (4.2, 4.3, 4.4, 4.5)

Key Concepts

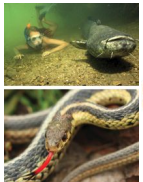
When scientists change only one variable in an investigation, they can figure out if it makes a difference.

Light receptors in the eye respond to light and send information to the brain. The brain processes this information to form an image.

After forming an image, the brain compares the image to memories. Then an animal can make a decision that could help it survive.

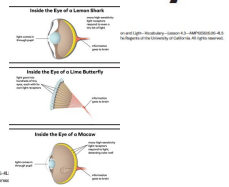
Different animals can have light receptors with different sensitivities. The brain cannot form a clear image if there is too much or too little light for the type of receptors an animal has.

process



sensitive

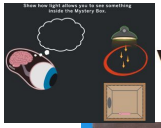
sensitivity



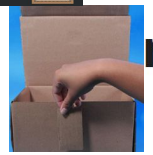
Vocabulary

predator

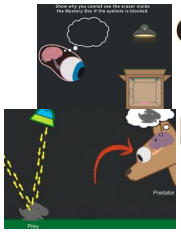
prey



variable



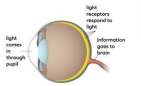
model



evidence

reflect

explanation



receptor

Revisiting our objectives

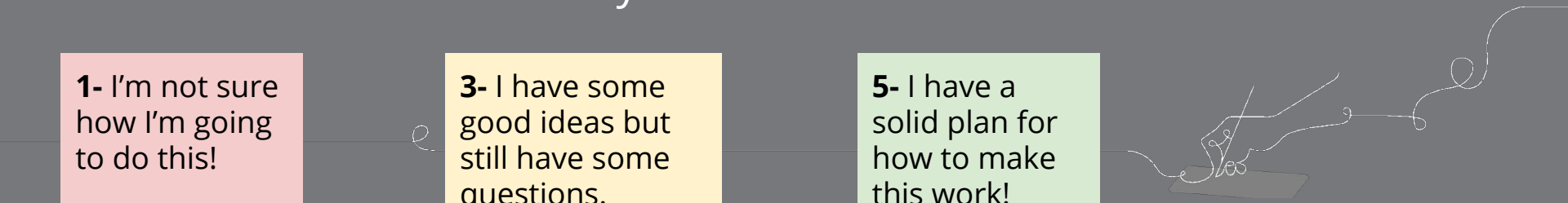
Do you feel ready to to…

- Elaborate on the central role academic discourse & questioning strategies play in 3-dimensional, multimodal learning.
- Adapt Amplify Science discourse routines, questioning strategies, and the classroom wall to meet the needs of all students in a remote/hybrid instructional context.

1- I'm not sure how I'm going to do this!

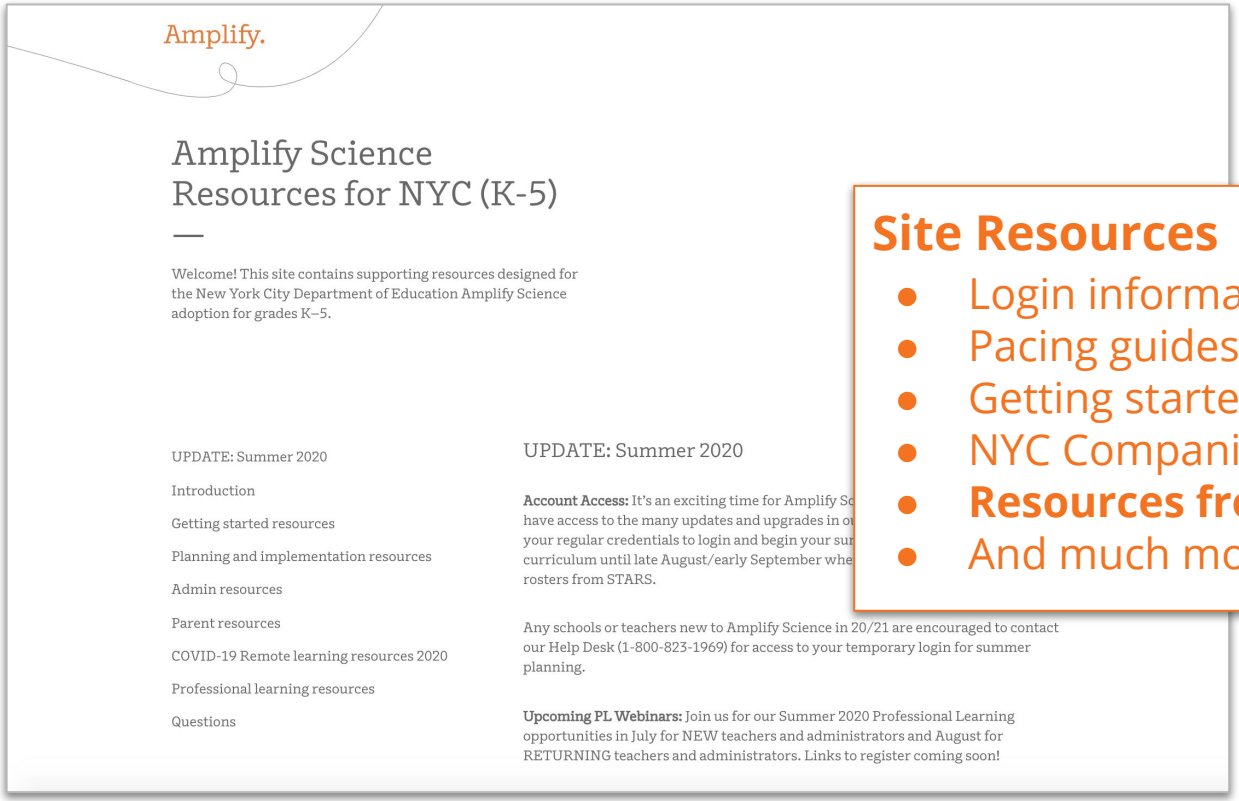
3- I have some good ideas but still have some questions.

5- I have a solid plan for how to make this work!



New York City Resources Site

https://amplify.com/amplify-science-nyc-doe-resources/



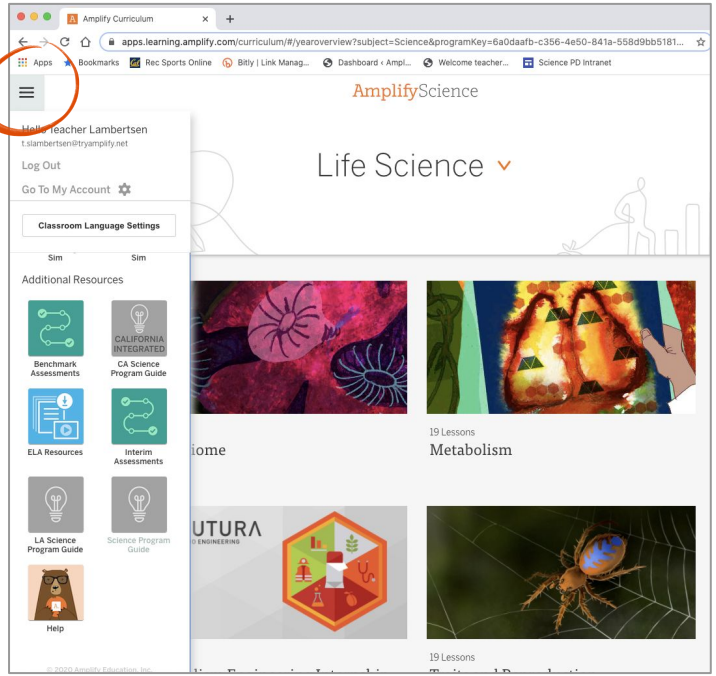
Site Resources

- Login information
- Pacing guides
- Getting started guide
- NYC Companion Lessons
- **Resources from PD sessions**
- And much more!

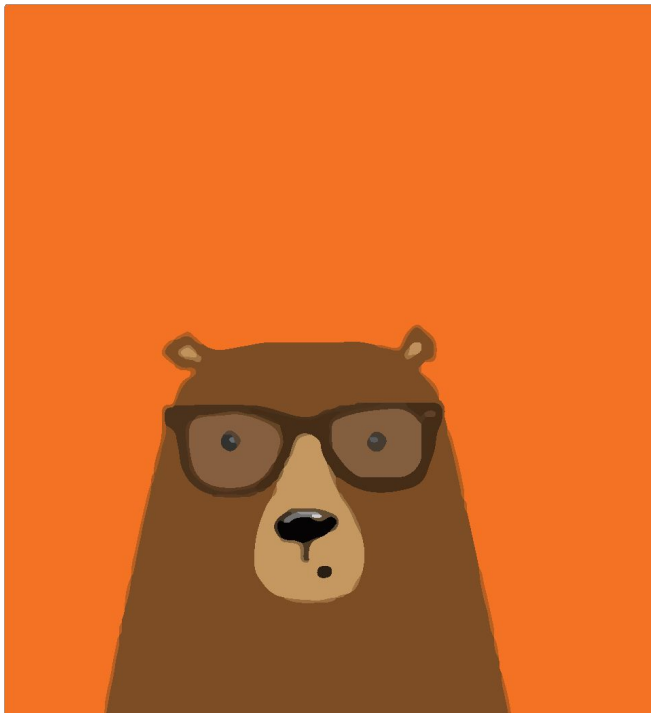
Amplify Science Program Hub

A new hub for Amplify Science resources

- **Videos and resources to continue getting ready to teach**
- Amplify@Home resources
- Keep checking back for updates



Additional Amplify resources



Program Guide

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

https://my.amplify.com/programguide/content/national/welcome/science/

Amplify Help

Find lots of advice and answers from the Amplify team.

my.amplify.com/help

Additional Amplify Support

Customer Care

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

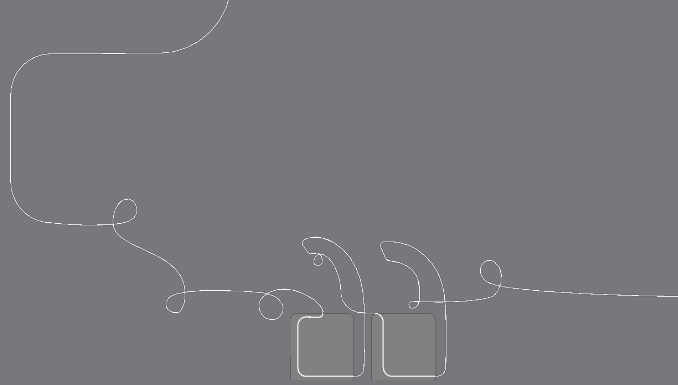
scihelp@amplify.com

800-823-1969

Amplify Chat

When contacting the customer care team:

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

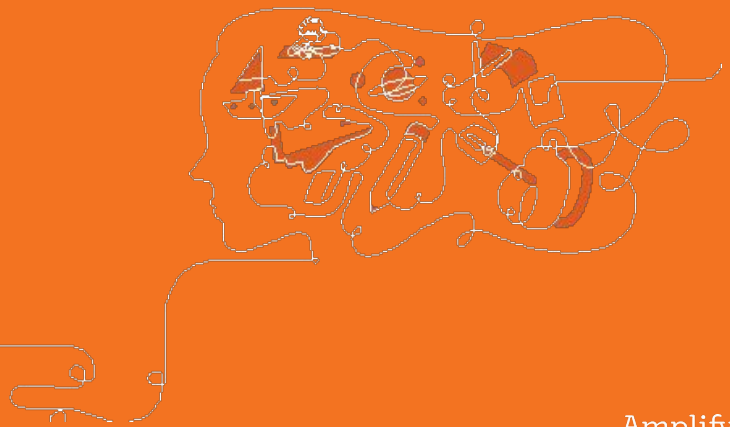


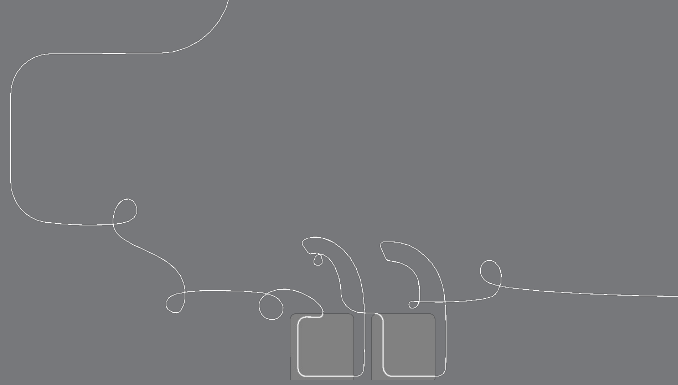
Final Questions?

Please provide us feedback!

URL: https://www.surveymonkey.com/r/BY56SBR

Presenter name: XXX





30 minute open office hours to follow...