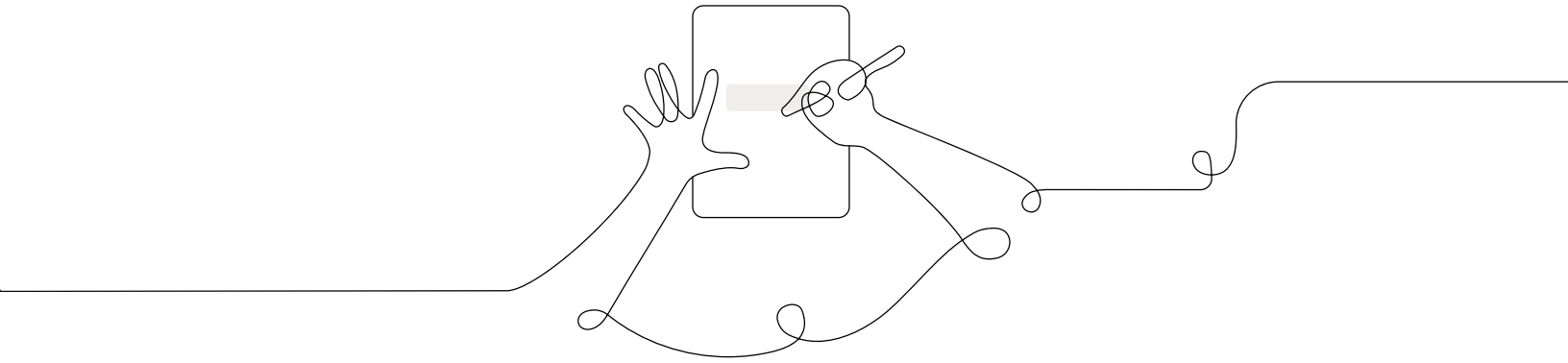
AmplifyScience

Participant Notebook

Unit Internalization and Guided Planning

Grade 8, Evolutionary History



Unit Guide resources

Once a unit is selected, select **JUMP DOWN TO UNIT GUIDE** in order to access all unit-level resources in an Amplify Science unit.

Planning for the unit

Unit Overview	Describes what's in each unit, the rationale, and how students learn across chapters
Unit Map	Provides an overview of what students figure out in each chapter, and how they figure it out
Progress Build	Explains the learning progression of ideas students figure out in the unit
Getting Ready to Teach	Provides tips for effectively preparing to teach and teaching the unit in your classroom
Materials and Preparation	Lists materials included in the unit's kit, items to be provided by the teacher, and briefly outlines preparation requirements for each lesson
Science Background	Adult-level primer on the science content students figure out in the unit
Standards at a Glance	Lists Next Generation Science Standards (NGSS) (Performance Expectations, Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts), Common Core State Standards for English Language Arts, and Common Core State Standards for Mathematics

Teacher references

Lesson Overview Compilation	Lesson Overview of each lesson in the unit, including lesson summary, activity purposes, and timing
Standards and Goals	Lists NGSS (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts) and CCSS (English Language Arts and Mathematics) in the unit, explains how the standards are reached
3-D Statements	Describes 3-D learning across the unit, chapters, and in individual lessons
Assessment System	Describes components of the Amplify Science Assessment System, identifies each 3-D assessment opportunity in the unit
Embedded Formative Assessments	Includes full text of formative assessments in the unit
Books in This Unit	Summarizes each unit text and explains how the text supports instruction
Apps in This Unit	Outlines functionality of digital tools and how students use them (in grades 2-5)

Printable resources

Copymaster Compilation	Compilation of all copymasters for the teacher to print and copy throughout the unit
Investigation Notebook	Digital version of the Investigation Notebook, for copying and projecting
Multi-Language Glossary	Glossary of unit vocabulary in multiple languages
Print Materials (8.5" x 11")	Digital compilation of printed cards (i.e. vocabulary cards, student card sets) provided in the kit
Print Materials (11" x 17")	Digital compilation of printed Unit Question, Chapter Questions, and Key Concepts provided in the kit

Unit Map

Is this Mystery Fossil more closely related to wolves or to whales?

Students act as student paleontologists to discover the evolutionary history of a mystery fossil. Is this species more closely related to wolves or whales, and how did all three species change over time? Students learn how to interpret similarities and differences among fossils, they investigate how natural selection can lead to one population becoming two different species, and also investigate evolution over vast periods of time.

Chapter 1: Where in the museum does this new fossil belong?

Students figure out: The Mystery Fossil likely shares a common ancestor with both wolves and whales. A species is a group of the same kind of living thing that can reproduce with each other. Species that look very different can share similar structures. Traits, such as structures, are passed down from parents to offspring. When two species have many similar structures, this is evidence that both species descended from a common ancestor with those structures.

How they figure it out: They sort species using similarities and differences, read an article about related species and common ancestors, and trace similar structures back to common ancestors in the Simulation. They analyze similarities among the Mystery Fossil, wolves, and whales, and show their understanding in a visual model.

Chapter 2: How did wolves, whales, and the Mystery Fossil become so different from their common ancestor population?

Students figure out: These three species could have been separated into different environments. Populations can become separated in different environments, with different selection pressures. Mutations can introduce different changes to existing structures in each population. Due to natural selection, small changes that are helpful for survival in each population are more likely to get passed down to offspring. Over generations, two populations of the same species can begin to differ more from each other. When the two populations become so different that they no longer reproduce with each other, they become different species.

How they figure it out: They revisit the *Natural Selection* Simulation, read articles about examples of speciation, and model speciation in the *Natural Selection* Simulation. They explore evolution and deep time through a card sort and in the Sim. They create models to show how small changes can add up to larger changes over deep time, and apply their understanding to the evolutionary history of the Mystery Fossil species.

Chapter 3: How can we tell if the Mystery Fossil is more closely related to wolves or to whales?

Students figure out: Because the Mystery Fossil shares key features that are common to cetaceans and not found in other organisms, the Mystery Fossil is more closely related to whales. Life has been evolving on Earth for over 3 billion years. Small changes introduced by mutations add up to larger changes over geologic time. Populations continue to become separated in different environments, and speciation continues to happen again over geologic time. This makes it possible for descendants of the same common ancestor population to have very different structures.

How they figure it out: They investigate evolutionary relationships using a physical model. They explore the key common features of whales and wolves in the Sim, then analyze evidence about the Mystery Fossil to draw a final conclusion about the Mystery Fossil.

Chapter 4: Students apply what they learn to a new question—Is the Tometti fossil more closely related to ostriches or to crocodiles?

Using detailed observations as evidence, students consider another mystery fossil and argue about whether it is more closely related to ostriches or crocodiles. They engage in oral argumentation in a student-led discourse routine called a Science Seminar and then write final arguments.

Progress Build

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

The *Evolutionary History* Progress Build consists of three levels of science understanding. To support a growth model for student learning progress, each level encompasses all of the ideas of prior levels and represents an explanatory account of unit phenomena, with the sophistication of that account increasing as the levels increase. At each level, students add new ideas and integrate them into a progressively deeper understanding of how anatomical structures are inherited and change over evolutionary time, and how similarities and differences can be used to interpret evolutionary relationships. Since the Progress Build reflects an increasingly complex yet integrated explanation, we represent it by including the new ideas for each level in bold.

Prior knowledge (preconceptions). At the start of the *Evolutionary History* unit, we expect middle school students to have completed the Amplify Science *Natural Selection* unit or a similar unit that covers the mechanism of change in a population. Students may hold conceptions about how organisms can (or cannot) change over time; these conceptions are often influenced by creation stories students hear in their home lives and cultures of origin. When students do believe that species can change over time, they may hold a "ladder" conception of change in which some organisms are better than others (typically, humans are at the top of the ladder) or a "purposeful" conception of change in which organisms can choose the best structural changes to adapt to their environments. Many students are fascinated by the diversity of life on Earth, and will likely be familiar with various categories of animals (such as mammals, dinosaurs, and carnivores) and will know that organisms in these groups are somehow related. However, students may not understand how scientists use anatomical structures to determine the relationships between species. Students are likely to have thought about extinction and fossils in the context of dinosaurs, but many not have considered other fossils and extinct species. They may not have considered that different fossils may be very different ages, and represent evidence of very different times on Earth. Students' experience and prior knowledge can be built on and re ned, which the *Evolutionary History* Progress Build and unit structure are designed to do.

Progress Build Level 1: Body structures shared between species are evidence that these two species inherited the shared structures from a common ancestor population.

Different species can share body structures. When two species share structures, it is evidence that these species may be descended from a common ancestor population that also had those structures. This is because species inherit their body structures from their ancestor populations.

Progress Build Level 2: Species that share structures can have differences because they have been in separate environments, and have changed in different ways over time.

Different species can share body structures. When two species share structures, it is evidence that these species may be descended from a common ancestor population that also had those structures. This is because species inherit their body structures from their ancestor populations. **Although two or more species can share structures, these**

structures can also have differences. Differences in shared structures may be evidence that these species had a common ancestor population that was separated into different environments, where different changes arose through natural selection as the environments changed over time. Over many generations and very long periods of time (hundreds of thousands to millions of years), the accumulation of these changes can result in different populations having larger differences in their shared structures.

Progress Build Level 3: Because populations separate and begin evolving differences at different points in time, similarities and differences in body structures can be used to interpret evolutionary relationships.

Different species can share body structures. When two species share structures, it is evidence that these species may be descended from a common ancestor population that also had those structures. This is because species inherit their body structures from their ancestor populations. Although two or more species can share structures, these structures can also have differences. Differences in shared structures may be evidence that these species had a common ancestor population that was separated into different environments, where different changes arose through natural selection as the environments changed over time. Over many generations and very long periods of time (hundreds of thousands to millions of years), the accumulation of these changes can result in different populations having larger differences in their shared structures. **Populations separate into different environments at different points over time. The more recently that populations separated, the more recently they shared a common ancestor and the more closely related they are. Body structures that are unique to a group of species but are not shared by other species provide evidence that all species with that structure share a common ancestor that is more recent than the common ancestor they share with the species that do not have that structure.**

Guided Unit Internalization Planner

Unit-level internalization

Unit title:

What is the phenomenon students are investigating in your unit?	
Unit Question:	**Student role:**
By the end of the unit, students figure out ...	
What science ideas do students need to figure out in order to explain the phenomenon?	

Unit Guide Document

Unit Map

Lesson Overview Compilation

Progress Build

Guided Unit Internalization

Part 1: Unit-level internalization

Unit title: Evolutionary History

What is the phenomenon students are investigating in your unit?

Students acts as student paleontologists to discover the evolutionary history of a mystery fossil. Is this species more closely related to wolves or whales, and how did all three species change over time?

Unit Question:

Why do species, both living and extinct, share similarities and also have differences?

Student role:

Student paleontologists

By the end of the unit, students figure out ...

Because the Mystery Fossil shares key features that are common to cetaceans and not found in other organisms, the Mystery Fossil is more closely related to whales. Life has been evolving on Earth for over 3 billion years. Small changes introduced by mutations add up to larger changes over geologic time. Populations continue to become separated in different environments, and speciation continues to happen again over geologic time. This makes it possible for descendants of the same common ancestor population to have very different structures.

What science ideas do students need to figure out in order to explain the phenomenon?

Body structures shared between species are evidence that these two species inherited the shared structures from a common ancestor population. Species that share structures can have differences because they have been in separate environments, and have changed in different ways over time. Because populations separate and begin evolving differences at different points in time, similarities and differences in body structures can be used to interpret evolutionary relationships.

Evolutionary History @Home Lesson Index

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

Index: @Home Unit Lessons and corresponding *Evolutionary History* Lessons

@Home Lesson	**Adapted from Amplify Science *Evolutionary History***
@Home Lesson 1	Lesson 1.2
@Home Lesson 2	Lesson 1.3
@Home Lesson 3	Lesson 1.4
@Home Lesson 4	Lesson 1.5
@Home Lesson 5	Lesson 2.1
@Home Lesson 6	Lesson 2.2
@Home Lesson 7	Lesson 2.3 and 2.4
@Home Lesson 8	Lesson 2.4 and 2.5
@Home Lesson 9	Lesson 3.1
@Home Lesson 10	Lesson 3.2
@Home Lesson 11	Lesson 3.3
@Home Lesson 12	Lesson 4.1 and 4.2
@Home Lesson 13	Lesson 4.3
@Home Lesson 14	Lesson 4.4

The student sheets and packets used in @Home units are original or modified versions of the unit's Amplify Science Investigation notebook pages or copymasters. When necessary, new pages were also created. In the following table we have outlined the @Home Student Sheet and Packet page titles and their origins.

Index: @Home Student Sheets/Packets and corresponding *Evolutionary History* materials

@Home Lesson	Student Sheet/Packet page title	Investigation Notebook page, copymaster, or print material	Possible Responses
1	Finding Similarities Between Species	Modified, based on Pg. 7	Lesson 1.2, Activity 3, Possible Responses
1	Species Cards	Lesson 1.2 Digital Resources	N/A
1	*Evolutionary History* Glossary	Lesson 1.1 Digital Resources	N/A
2	"How You Are Like a Blue Whale" article	Lesson 1.3 Digital Resources	N/A
3	Rereading "How You Are Like a Blue Whale"	Pg. 16	Lesson 1.4, Activity 2, Possible Responses
3	Tracing Structures in an Evolutionary Tree	Modified, based on Pg. 17 and 18	Lesson 1.4, Activity 3, Card 1, Possible Responses
4	Comparing the Mystery Fossil to Whales and Wolves	Pg. 23	Lesson 1.5, Activity 3, Possible Responses
4	Modeling Body Structures	Modified, based on Pg. 22–24	Lesson 1.5, Activity 4, Possible Responses
4	Chapter 1 Science Wall	New, based on Classroom Wall materials	N/A
5	Observing Organisms to Consider Differences	Modified, based on Pg. 30 and 31	Lesson 2.1 Activity 2, Cards 1 and 2, Possible Responses
5	Species Cards	Printable Resources 8.5 x 11	N/A
6	*Where Do Species Come From?* Article set	Lesson 2.2 Digital Resources	N/A
7	Rereading *Where Do Species Come From?*	Modified, based on Pg. 39	Lesson 2.3, Activity 2, Cards 1–3, Possible Responses
8	Comparing Structural Changes in the Sim	New	Lesson 2.4, Activity 4, Possible Responses

8	Modeling Population Changes Over Time	New	N/A
8	Modeling Population Changes Over Time Paper Modeling Tool	Modified based on pg. 53	Lesson 2.5, Activity 2, Possible Responses
8	Chapter 2 Science Wall	New, based on Classroom Wall materials	N/A
9	K'NEX Species Structures	Modified, based on Pg. 81	Lesson 3.1, Activity 2, Card 1, Possible Responses
9	Thinking About Evolutionary Relationships	Modified, based on Pg. 82	Lesson 3.1, Activity 2, Card 2, Possible Responses
10	Investigating the Relatedness of Extinct Whales	Modified, based on Pgs. 88 and 89	Lesson 3.2, Activity 2, Possible Responses
10	Word Relationships Routine	Modified, based on Pg. 90	Lesson 3.2, Activity 3, Possible Responses
11	Considering Body Structures of Whales and Wolves	Modified, based on Pg. 94 and Printable Resource 11 x 17	Lesson 3.3, Activity 2, Possible Responses
11	Comparing Body Structures Cards	Printable Resource 11 x 17	N/A
11	Examining Diagnostic Structures	Modified, based on Pg. 95	Lesson 3.3, Activity 3, Possible Responses
11	Making an Argument About Where in the Museum to Place the Mystery Fossil	Modified, based on Pg. 97	Lesson 3.3, Activity 4, Possible Responses
11	Chapter 3 Science Wall	New, based on Classroom Wall materials	N/A
12	Science Seminar Evidence Cards	Lesson 4.2 Digital Resources	N/A
12	Argument Organizer	Lesson 4.2 Digital Resources	N/A
13	Argumentation Sentence Starters	Printable Resources 8.5 x 11	N/A
13	Writing a Scientific Argument	Modified, based on Pgs. 116–118	Lesson 4.3, Activity 3, Possible Responses
14	Written-Response Question #1	Lesson 4.4 Digital Resources, Pgs 16 and 17	Lesson 4.4, Activity 2, Possible Responses
14	Written-Response Question #2	Lesson 4.4 Digital Resources, Pgs 18 and 19	Lesson 4.4, Activity 3, Possible Responses

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

Day @Home Lesson 1

Minutes for science: 15 min.	**Minutes for science:** 30 min
Instructional format: ☒ Asynchronous ☐ Synchronous	**Instructional format:** ☐ Asynchronous ☒ Synchronous
Lesson or part of lesson: Introducing the mystery fossil & the Natural History Museum (slides 1-12)	**Lesson or part of lesson:** Examine images of body structures, group species & compare two organisms
Mode of instruction: ☒ Preview ☐ Review ☐ Teach full lesson live ☐ Teach using synchronous suggestions ☒ Students work independently using: ☐ Printed @Home Slides ☒ Digital @Home Slides ☐ @Home Videos	**Mode of instruction:** ☐ Preview ☐ Review ☐ Teach full lesson live ☒ Teach using synchronous suggestions ☐ Students work independently using: ☐ Printed @Home Slides ☐ Digital @Home Slides ☐ @Home Videos
Students will... View slides and the video that introduces students to the unit. Jot down initial ideas about their reactions to the video.	**Teacher will...** Assign slides 1-12 in Schoology and provide direction for students to jot down their ideas about the unit problem to share when the class meets together.
Students will... Examine images of body structures of different species Consider how to group these species Compare two organisms to learn more about the importance of careful observations	**Teacher will...** Lead students through the lesson activities using slides 13-60 allowing students time to collaborate as they discuss their observations of the images of body structures & the two organisms

Look at the *Students will* columns. What are students working in the lesson(s) that you could collect, review, or provide feedback on?
See Some Types of Written Work in Amplify Science to the right for guidance.

If there isn't a work product listed above, do you want to add one? Make notes below.

Asynchronous: students jot down their initial ideas

Synchronous: record observations of body structures

Some Types of Written Work in Amplify Science

- Daily written reflections
- Homework tasks
- Investigation notebook pages
- Written explanations (typically at the end of Chapter)
- Diagrams
- Recording pages for Sim uses, investigations, etc

How will students submit this work product to you?
See the Completing and Submitting Written Work tables to the right for guidance on how students can complete and submit work.

Asynchronous: students jot initial ideas on paper or digitally to bring with them to the asynchronous lesson

Synchronous: Students will use the student sheets to record their observations of the body structures and submit through Schoology

Completing Written Work	Submitting Written Work
• Plain paper and pencil (videos include prompts for setup) • (6-8) Student platform • Investigation Notebook • Record video or audio file describing work/answering prompt • Teacher-created digital format (Google Classroom, etc)	• Take a picture with a smartphone and email or text to teacher • Through teacher-created digital format • During in-school time (hybrid model) or lunch/materials pick-up times • (6-8) Hand-in button on student platform

How will you differentiate this lesson for diverse learners? (Navigate to the lesson level on the standard Amplify Science platform and click on differentiation in the left menu.)

Supports:

- Provide students with the Multi-Language Glossary where appropriate
- Provide sentence starters
- Leverage primary language for discussions

Extension:

- Have students write questions about the unit phenomenon.

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

<table>
<tr><td colspan="4">Day _____</td></tr>
<tr><td colspan="2">Minutes for science: _____

Instructional format:
❑ Asynchronous
❑ Synchronous</td><td colspan="2">Minutes for science: _____

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<tr><td colspan="2">Lesson or part of lesson:

Mode of instruction:
❑ Preview
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❑ Teach full lesson live
❑ Teach using synchronous suggestions
❑ Students work independently using:
❑ Printed @Home Slides
❑ Digital @Home Slides
❑ @Home Videos</td><td colspan="2">Lesson or part of lesson:

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

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How will you differentiate this lesson for diverse learners? (Navigate to the lesson level on the standard Amplify Science platform and click on differentiation in the left menu.)

@Home Teacher Overview - Chapter 1
Overview of Evolutionary History @Home Lessons 1-5

@Home Lesson 1

Students are introduced to the unit problem and their role as student paleontologists. Students gain experience noticing similarities between species by examining images that show the body structures of many different species, living and extinct, and considering how to group these species. Students compare two organisms in order to learn about the importance of making careful observations when examining body structures.

@Home Lesson 2

Breakout Group 1

Students consider shared structures in seemingly dissimilar species. Students read and annotate the article, “How You Are Like a Blue Whale,” to learn about how the similarities between whale and human body structures provide evidence that whales and humans share a common ancestor. Students share their questions and ideas about the article, “How You Are Like a Blue Whale.”

@Home Lesson 3

Breakout Group 2

Students use what they have learned about examining body structures to practice identifying the shared body structures in two imaginary species. Students return to the "How You Are Like a Blue Whale" article to practice reading and interpreting evolutionary trees and to collect more evidence about why species share similarities. Students use the *Evolutionary History* Sim and use shared structures to study relationships between descendant species.

@Home Lesson 4

Breakout Group 3

Students learn that the Mystery Fossil was pregnant, and take live birth into account as they weigh claims that the Mystery Fossil shares a common ancestor respectively with whales, wolves, or crocodiles. Students find structural similarities among the Mystery Fossil, the whale, and the wolf, then consider what a common ancestor might have looked like. Students make a model that shows a likely common ancestor based on structures shared between two new, imaginary species.

@Home Lesson 5

Breakout Group 4

Students practice making careful observations by looking for differences in the bone structures of human and cat front limbs. Students observe organisms’ front limb structures, then read and record information about the organisms’ environments and behaviors. Students discuss observations and think about the differences between the structures of three organisms.

Suggestions for synchronous time

The following are some ideas for making the most of synchronous time with your students. As a general rule, the best way to use your synchronous time is to provide students opportunities to talk to one another, or to observe or visualize things they could not do independently.

Online synchronous time	Notes
Online discussions: It's worthwhile to establish norms and routines for online discussions in science to ensure equity of voice, turn-taking, etc. **Digital tool demonstrations:** You can share your screen and demonstrate, or invite your students to share their screen and think-aloud as they use a Simulation or other digital tool. **Interactive read-alouds**: Screen share a digital book or article, and pause to ask questions and invite discussion as you would in the classroom. **Shared Writing:** This is a great opportunity for a collaborative document that all your students can contribute to. **Co-constructed class charts:** You can create digital charts, or create physical charts in your home with student input.	

Questioning Strategies for Grades 6–8

Overview of the Role of Open-Ended Questioning

Repeated opportunities for students to listen to and speak with others are essential for promoting deep thinking and learning in science. Meaningful teacher-initiated questions create a rich context for promoting open-ended student dialogue and discussion. The *Science Framework for California Public Schools* explains that "Simply providing opportunities to talk is not enough. Effective questioning can scaffold student thinking" (*California Science Framework*, 2016, Chapter 11, p. 21). The Framework suggests that "Teacher-initiated questions are key to helping students expand their communication, reasoning, arguments, and representation of ideas in science" (*California Science Framework*, 2016, Chapter 11, p. 21). The types of questions that teachers pose are instrumental in supporting student understanding. The Framework calls for more open-ended teacher questioning that "prompts and facilitates students' discourse and thinking" and less teacher questioning that prompts "students to seek a confirmatory right answer" (*California Science Framework*, 2016, Chapter 11, p. 6).

The Amplify Science Teacher's Guide is infused with opportunities for students to discuss their developing ideas in response to open-ended prompts. Questions to promote student thinking and discussion are purposefully built into the Teacher's Guide instructional steps and Teacher Support notes that surround all our hands-on and reading activities. In addition, all units include discourse routines (e.g., Shared Listening, Think-Draw-Pair-Share, Write and Share, Word Relationships) that provide opportunities for students to use focal unit vocabulary as they think and talk with partners and the class about their understanding of key science content and practices. Many of the On-the-Fly Assessment suggestions provided throughout each unit offer open-ended follow-up questions that can be used to probe student thinking and formatively assess student understanding of the content. In addition, each unit includes multiple opportunities for students to respond to open-ended questions through additional modalities (e.g., in writing, with diagrams, through a kinesthetic model).

While the prompts embedded in each of the opportunities mentioned above provide fertile ground for student discussion, continued use of flexible, open-ended questions is invaluable for assessing students' knowledge and skills, promoting student-to-student discourse, and guiding student learning. A collection of grade-appropriate questions follows that can be used for these purposes. You will also find a list of activity types included within the Amplify Science curriculum that are particularly conducive to the use of these questions. You may choose to print out these questions and activity types for reference throughout your instruction.

Open-Ended Questions to Facilitate Student Thinking and Discourse

Questions to assess students' knowledge and skills:

- Can you explain how you decided that this claim is the best one?
- Can you explain why X happened?
- Would you (and your partner) explain the steps you went through (to create the model you made)?
- How do you know X?
- If XXX were changed, how would that change YYY?

Questions to promote student-to-student discourse:

- Do you agree or disagree with (that idea)? Why?
- Can you add evidence to support (student name)'s thinking?
- Do you have evidence to go against (refute) (that idea)?
- Does anyone else have something to add to the conversation?
- We are working together right now to figure out/better understand X. Can anyone start us off with some thinking about this (question, problem, idea)?
- Can you explain X, using science vocabulary words XX and YY (from the unit)?
- What claim does this evidence support? How do you know?
- Can you explain why this evidence is important?
- Can you explain why this evidence does not support Claim Y?
- How does your idea relate to what others have said today?

Questions to guide student learning:

- I hear what you are saying (or I read your question/response). Can you explain your thinking to me a bit more so I can understand your idea?
- Some students have said that they think X happened. Can those students work together to find more evidence to support this idea?
- You are claiming that Y happened/explains this phenomenon.
    - Can you find more evidence to support your claim? Please go back to these resources (e.g., simulation, article) and see if you can find more evidence.
    - Which evidence can you use to make a stronger argument?
- How can we investigate why this happened?
- What did you notice? What else do we need to figure out?

Activity Types Within the Amplify Science Curriculum That Are Especially Suited for Additional Teacher Questioning

The activity types listed below are student-centered and often contain prompts for pairs or small groups of students to use to discuss content or to vet evidence together. As you circulate through the classroom during these activities, you can use the open-ended questions to assess students' knowledge and skills, promote student-to-student discourse, and guide student learning.

- Hands-on activities
- Discourse routines (e.g., Write and Share, Word Relationships)
- Discussion after reading
- Paired Modeling Tool activities
- Paired Reasoning Tool activities
- Paired Simulation activities
- Evidence Card sorts
- Evidence Gradient card sorts
- Discussion of evidence in preparation for a Science Seminar (discussing which claim the evidence supports and why, sorting evidence in pairs)
- Science Seminar

Amplify Science@Home resources reference

Use this guide to keep track of the different resources available for remote and hybrid learning.

Instructional materials: Click Remote and hybrid learning resources, then select your grade level from the dropdown menu. Select your unit.	
@Home Unit resources: These will appear when you select your unit.	
Teacher Overview	General information for teaching with @Home Units, planning information, chapter and lesson outlines
Lesson Index	Lists the original Amplify Science lessons associated with each @Home lesson, and the Investigation Notebook pages, copymasters, and print materials associated with the @Home Unit Student Sheets
Family Overview	Information to send home to families to help them support students with remote learning
Student lesson materials for @Home Units	Printable or digital lessons condensed to be about 30 minutes long. You can access compilations of all student materials for your unit, or select from individual lessons.
@Home Video resources: After selecting your grade level and unit, select the @Home Videos tab below your unit title.	
@Home Video links	Links to video lessons that include all activities from the original units. Lesson playlists are on YouTube, and they autoplay in a playlist form.
Additional remote and hybrid instructional materials: These can be accessed from the tabs below your unit title.	
Hands-on investigations support	Videos of every unit's hands-on activities (note, these videos also appear in the student lesson materials).
Read-aloud videos	Link to a YouTube playlist of read-aloud videos of all books in your unit.
Orientation and Tutorials: Click Remote and hybrid learning resources, then select your grade from the dropdown menu. Click Orientation and Tutorials. You'll not only find videos to help you use the resources, but also videos you can share with students and caregivers.	

Notes