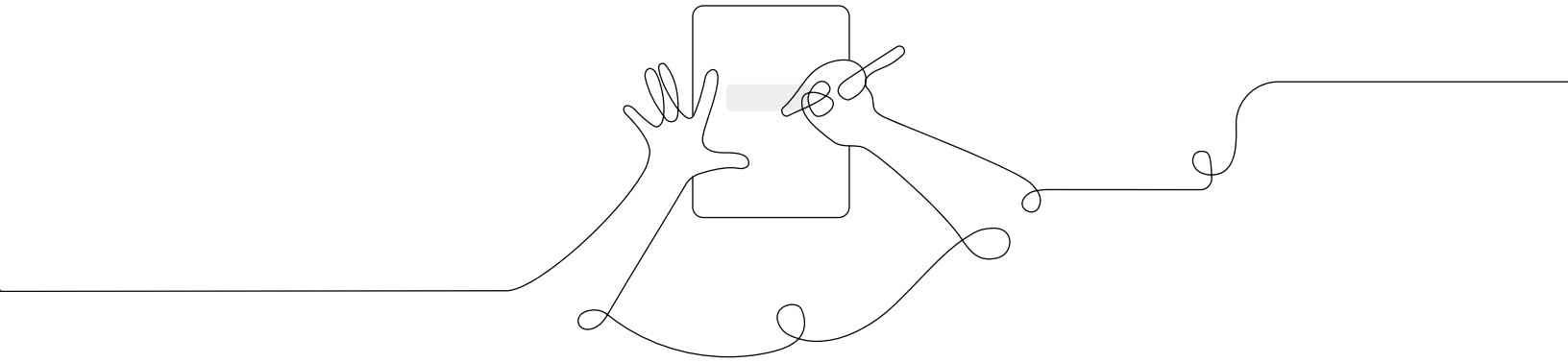
AmplifyScience

Participant Notebook

Unit Internalization and Guided Planning

Grade 6, Earth's Changing Climate



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

Why is the ice on Earth's surface melting?

In the role of student climatologists, students investigate what is causing ice on Earth's surface to melt in order to help the fictional World Climate Institute educate the public about the processes involved. Students consider claims about changes to energy from the sun, to the atmosphere, to Earth's surface, or in human activities as contributing to climate change.

Chapter 1: Why is the ice on Earth's surface melting?

Students figure out: The decrease in ice has been caused by an increase in the amount of energy absorbed at Earth's surface (shown by an increase in global average temperature). This increase in temperature correlates with changes to Earth's atmosphere over the same time period. As carbon dioxide and methane have increased in the atmosphere, so has the global average temperature.

How they figure it out: They analyze data about ice cover, temperature, and several gases in the atmosphere. They explore the unit's Simulation and test changes to the amounts of different gases in the atmosphere.

Chapter 2: Why do temperatures on Earth increase when the amount of carbon dioxide or methane in the Earth system increases?

Students figure out: The overall temperature of the Earth system can be stable even as energy is flowing into and out of the system. If this balanced flow is disrupted, there may be changes to the system. Temperature increases if more energy enters than exits, and decreases when less energy enters than exits. An increase in carbon dioxide or methane disrupts the system by causing less energy to exit than enter. This is because carbon dioxide and methane stop energy from leaving by redirecting energy that would have exited the system.

How they figure it out: They gather evidence about stable and changing systems of energy flow from a physical model and from the Simulation. They gather evidence from articles about climate changes in Earth's history. They show their ideas using the unit's Modeling Tool and by writing an explanation.

Chapter 3: What can be done to stop the carbon dioxide and methane in Earth's atmosphere from increasing?

Students figure out: The increases in carbon dioxide and methane in the atmosphere are due to human activities. They learn that combustion of fossil fuels releases carbon dioxide, that livestock release methane, and that combustion of fossil fuels and the amount of livestock kept have both been increasing. Students learn that reducing these activities can slow the addition of these gases to the atmosphere and that these gases can be taken out of the atmosphere by reforestation and by capturing these gases.

How they figure it out: They analyze data about human activity, test changes to human activities in the Simulation, and read an article about solutions to climate change. They show their understanding with the Modeling Tool and in writing.

Chapter 4: Students apply what they learn to a new question—How is Earth's climate affected in the five to ten years after a large volcanic eruption?

A large volcanic eruption adds carbon dioxide and sulfur dioxide to the atmosphere and can also affect forests, algae, and the combustion of fossil fuels by people. Although eruptions don't affect Earth's climate nearly as much as the human activities that are causing large-scale warming do, scientists study their impact in order to better understand and model Earth's climate. Students examine evidence, mostly from one large volcanic eruption—Pinatubo in 1991—to consider whether large volcanic eruptions cause warming or cooling of Earth's climate overall. They consider the factors that cause warming (such as the release of carbon dioxide and destruction of forests) as well as those that cause cooling (such as the release of sulfur dioxide and the interruption of human activities like air travel). 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 *Earth's Changing Climate* 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 what causes climate change 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 *Earth's Changing Climate* unit, middle school students will likely have some extracurricular exposure to the topic of climate change. Many students know that Earth is warming and that the polar ice caps are melting, but few will be able to explain why. Human pollution is often thought of in terms of littering, so the concept that "natural" substances like carbon dioxide or methane could be pollution will be unusual to students.

From the *Ocean, Atmosphere, and Climate* and *Weather Patterns* units, students will be familiar with the relationship between temperature and energy, and how energy coming from the sun is absorbed by Earth's surface and contributes to the global climate. Students will have little experience thinking of the atmosphere as being composed of many gases that interact with both incoming and outbound energy, so the Sim will be especially useful for supporting this understanding. This experience and prior knowledge can be built on and refined, which the *Earth's Changing Climate* Progress Build and unit structure have been designed to do.

Progress Build Level 1: Changes in the amount of carbon dioxide and methane in the atmosphere are correlated with changes in the amount of energy absorbed by Earth's surface.

When carbon dioxide and methane increase, the amount of energy absorbed by Earth's surface increases. When carbon dioxide and methane decrease, the amount of energy absorbed by the surface decreases.

Progress Build Level 2: Carbon dioxide and methane affect the balance of energy entering and exiting the Earth system.

Changes in the amounts of carbon dioxide and methane in the atmosphere are correlated with changes in the amount of energy absorbed by Earth's surface. When carbon dioxide and methane increase, the amount of energy absorbed by Earth's surface increases. When carbon dioxide and methane decrease, the amount of energy absorbed by the surface decreases. **The amount of energy absorbed by Earth's surface changes when the total amount of energy that enters or exits the system changes. If more energy has entered the system than has exited, there is more energy in the Earth system and the amount of energy absorbed by the surface will have increased (and vice versa, leading**

to decrease). Periods of time when the amount of carbon dioxide and methane in the atmosphere increase are correlated with times when the amount of energy that has entered the system is greater than the amount of energy that has left (and vice versa, leading to decrease).

Progress Build Level 3: Carbon dioxide and methane redirect outbound energy, which causes less energy to exit.

Changes in the amounts of carbon dioxide and methane in the atmosphere are correlated with changes in the amount of energy absorbed by Earth's surface. When carbon dioxide and methane increase, the amount of energy absorbed by Earth's surface increases. When carbon dioxide and methane decrease, the amount of energy absorbed by the surface decreases. The amount of energy absorbed by Earth's surface changes when the total amount of energy that enters or exits the system changes. If more energy has entered the system than has exited, there is more energy in the Earth system and the amount of energy absorbed by the surface will have increased (and vice versa, leading to decrease). Periods of time when the amount of carbon dioxide and methane in the atmosphere increase are correlated with times when the amount of energy that has entered the system is greater than the amount of energy that has left (and vice versa, leading to decrease). **Carbon dioxide and methane in the atmosphere redirect some outbound energy back toward Earth's surface, so an increase in the amount of these gases in the atmosphere leads to more energy being redirected back to Earth's surface. This leads to less energy leaving the Earth system, increasing the total energy within the Earth system (and vice versa, leading to decrease).**

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

Unit Map

Progress Build

Guided Unit Internalization

Part 1: Unit-level internalization

Unit title: Earth's Changing Climate

What is the phenomenon students are investigating in your unit?

Why is the ice on the Earth's surface melting?

Unit Question:

What causes climate change?

Student role:

Student climatologists

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

Students figure out that whenever more energy enters the atmosphere than exits, the amount of energy absorbed by the surface increases. Then they discover the cause of Earth's energy imbalance—increased carbon dioxide or methane in the atmosphere redirects outgoing energy back to Earth's surface, reducing the flow of energy that exits the Earth system. Through investigations, they learn that human activities, including increased combustion of fossil fuels and greater numbers of livestock kept for the benefit of humans, are responsible for increasing amounts of carbon dioxide and methane in the atmosphere.

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

Changes in the amount of carbon dioxide and methane in the atmosphere are correlated with changes in the amount of energy absorbed by Earth's surface.Carbon dioxide and methane affect the balance of energy entering and exiting the Earth system. Carbon dioxide and methane redirect outbound energy, which causes less energy to exit.

Earth's Changing Climate @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 *Earth's Changing Climate* Lessons

@Home Lesson	**Adapted from Amplify Science *Earth's Changing Climate***
@Home Lesson 1	Lesson 1.2 and 1.3
@Home Lesson 2	Lesson 1.4
@Home Lesson 3	Lesson 1.5
@Home Lesson 4	Lesson 2.1
@Home Lesson 5	Lesson 2.2
@Home Lesson 6	Lesson 2.3
@Home Lesson 7	Lesson 2.6 and 2.7
@Home Lesson 8	Lesson 3.1
@Home Lesson 9	Lesson 3.2
@Home Lesson 10	Lesson 3.3
@Home Lesson 11	Lesson 4.1
@Home Lesson 12	Lesson 4.2 and 4.3
@Home Lesson 13	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 *Earth's Changing Climate* materials

@Home Lesson	Student Sheet/Packet page title	Investigation Notebook page, copymaster, or print material	Possible Responses
1	Analyzing Climate Data	New	N/A
1	Making Ice Melt in the Sim	Modified, based on Pg. 12	Lesson 1.3, Activity 2, Possible Responses
1	*Earth's Changing Climate* Glossary	Lesson 1.2 Digital Resources	N/A
2	Testing Changes to the Atmosphere	Modified, based on Pg. 18	Lesson 1.4, Activity 3, Possible Responses
2	Testing Changes to the Atmosphere (continued)	Modified, based on Pg. 19	Lesson 1.4, Activity 3, Possible Responses
2	Testing Changes to the Atmosphere (continued)	Pg. 20	Lesson 1.4, Activity 3, Possible Responses
2	Using the Word Relationships Routine to Reflect	Pg. 21	Lesson 1.4, Activity 4, Possible Responses
3	Analyzing Gas and Temperature Data	Modified, based on Pgs. 25-27	Lesson 1.5, Activity 2, Possible Responses
3	Making a Model to Show Your Ideas	New	N/A
3	Chapter 1 @Home Science Wall	New, based on Classroom Wall materials	N/A
4	Energy Token Physical Model	Pg. 34	N/A
4	Energy Token Model (continued)	8.5 x 10 Print Materials	N/A
4	Energy Token Physical Model (continued)	Pg. 35 and 36	Lesson 2.1, Activity 2, Possible Responses
4	Investigating Energy in the Sim	Pg. 37	Lesson 2.1, Activity 3, Possible Responses
4	Investigating Energy in the Sim (continued)	Modified, based on Pg. 38	Lesson 2.1, Activity 3, Possible Responses

5	“Past Climate Changes on Earth” article	Lesson 2.2 Digital Resources	N/A
6	Second Read of “Past Climate Changes on Earth”	Pg. 46	Lesson 2.3, Activity 2, Possible Responses
6	Modeling an Increase in Temperature Due to Gases	New	N/A
7	Investigating Energy Interactions in the Sim	Modified, based on Pg. 69	Lesson 2.6, Activity 2, Possible Responses
7	Investigating Energy Interactions in the Sim (continued)	Modified, based on Pg. 70	Lesson 2.6, Activity 2, Possible Responses
7	Investigating Energy Interactions in the Sim (continued)	Pg. 71	Lesson 2.6, Activity 2, Possible Responses
7	Discussing Causes of Climate Change	Modified, based on Pg. 79	Lesson 2.7, Activity 3, Possible Responses
7	Chapter 2 @Home Science Wall	New, based on Classroom Wall materials	N/A
8	Investigating Human Activities in the Sim	Modified, based on Pgs. 86-89	Lesson 3.1, Activity 2, Possible Responses
8	Analyzing Human Activities Data	New	N/A
9	“Climate Change Solutions” article	Lesson 3.2 Digital Resources	N/A
10	Rereading About One Solution	Pg. 101	N/A
10	Modeling One Solution	New	N/A
10	Chapter 3 @Home Science Wall	New, based on Classroom Wall materials	N/A
11	Science Seminar Evidence Cards	Lesson 4.1 and Lesson 4.2 Digital Resources Copymaster	N/A
11	Argument Organizer	Lesson 4.2 Digital Resources	N/A
12	Argumentation Sentence Starters	8.5 x 11 Print Resources	N/A
12	Writing a Scientific Argument	Modified, based on Lesson 4.3 Digital Resources Writing Prompt Copymaster	Lesson 4.3, Activity 3, Possible Responses

12	Chapter 4 @Home Science Wall	New, based on Classroom Wall materials	N/A
13	Written-Response Question #1	Lesson 4.4 Digital Resources Copymaster	Lesson 4.4, Activity 2, Possible Responses
13	Written-Response Question #1	Lesson 4.4 Digital Resources Copymaster	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.

Instructional format:
- [x] Asynchronous
- [ ] Synchronous

Lesson or part of lesson:
Introduce, Why the ice on Earth's surface is melting? (slides 1-12)

Mode of instruction:
- [x] Preview
- [ ] Review
- [ ] Teach full lesson live
- [ ] Teach using synchronous suggestions
- [x] Students work independently using:
  - [ ] Printed @Home Slides
  - [x] 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.

Minutes for science: 30 min

Instructional format:
- [ ] Asynchronous
- [x] Synchronous

Lesson or part of lesson:
Summarize the introduction to the unit. Introduce the first claim and have students work in breakout rooms to review data about the claim. Together the class will work on the SIM to investigate the question: "What could be causing ice to melt and temperatures to increase on Earth?

Mode of instruction:
- [ ] Preview
- [ ] Review
- [ ] Teach full lesson live
- [x] Teach using synchronous suggestions
- [ ] Students work independently using:
  - [ ] Printed @Home Slides
  - [ ] Digital @Home Slides
  - [ ] @Home Videos

Students will...
Discuss the claim and their initial ideas about the data they collected in groups (slides 13-19). Engage with the simulation (34-46)to develop an understanding of the factors that affect global average temperature and then reflect on their observations.

Teacher will...
Revisit the unit question on slide 12 and introduce the claim on slide 13. Present slides 20-31 giving students an opportunity to understand trends and fluctuations in climate data. Use slides 34-46 to answer and reflect on the Investigation Question: What could be causing ice to melt and temperatures to increase on Earth?

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 while analyzing Climate Data and record observations as they explore making ice melt in the Simulation.

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 while analyzing Climate Data as well as their observations as they explore the Simulation 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:

- Encourage students to engage in student-to-student discussion
- Provide students with the Multi-Language Glossary where appropriate, add images
- Leverage primary language for discussions
- Teacher modeling of the simulation (could also use the video)
- Strategic grouping
- You may want to extend the lesson and provide more whole class time to talk about the Climate Data graphs.
- Think about other examples of where trends and fluctuation might be common-taking your own temperature on one day when you have a fever does not give an indication of your normal body temperature.

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

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❑ Asynchronous
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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.)

Teacher Overview - Chapter 1
Overview of @Home Lessons 2-5

@Home Lesson 2: GROUP 1

- Students use the Earth's Changing Climate Simulation to gather evidence about the effects of changing the amounts of different gases the atmosphere. Students engage in the Word Relationships routine to discuss what changes to the atmosphere could affect how much energy is absorbed by Earth's surface.

@Home Lesson 3: GROUP 2

- Students analyze graphs showing the level of carbon dioxide, methane, and sulfur dioxide in the atmosphere over time. Students review the @Home Science Wall, including the Chapter 1 Question, key concepts, and vocabulary.Students create models to show one idea about why the ice on Earth's surface is decreasing and temperature is increasing.

@Home Lesson 4: GROUP 3

- Students use a physical model to investigate energy exiting and entering the Earth system. Students watch a video to reinforce ideas about stability and change, and energy in the Earth system. Students use the Earth's Changing Climate Simulation, or watch a video of the Simulation, to test the amount of energy that enters and exits the Earth system when specific changes are made.

@Home Lesson 5: GROUP 4

- Students read and annotate "Past Climate Changes on Earth" to learn more about how the relationship between energy entering and exiting Earth's system affects climate. Pairs discuss the article they read and the annotations they made.

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