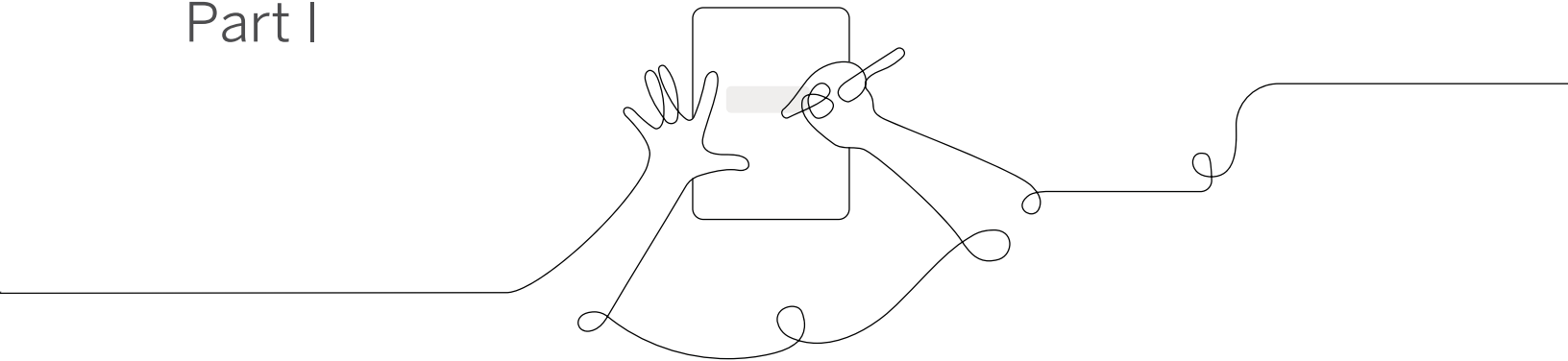


Participant Notebook

Grade 1: Light and Sound
Guided Unit Internalization with @Home
Resources
Part I



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

How can we use light and sound to design shadow scenery and sound effects for a puppet theater?

Students take on the dual role of light engineers and sound engineers for a puppet-show company as they investigate cause-and-effect relationships and learn about the nature of light and sound. They apply what they learn to designing shadow scenery and sound effects for a puppet show.

Chapter 1: How do we make brighter or darker areas on a surface?

Students figure out: Without light, we cannot see. Light comes from a source and travels to a surface. Light from the source must be getting to the surface in order to make some parts of the surface look bright. If there is no light source, a surface looks dark.

How they figure it out: The class attempts, in vain, to make the classroom completely dark, identifying light sources at each failed attempt. Students read a book about whether one can see in the dark, and then they hunt for light sources in their school and in the pictures of a book. Students investigate a series of questions with their own light source (a flashlight), investigating how light gets to a surface.

Chapter 2: How do we make a dark area in a bright puppet show scene?

Students figure out: A dark area is the result of putting an object between a light source and a surface. When an object blocks a light source, the surface behind the object looks darker. This dark area is called a shadow.

How they figure it out: Students explore by making shadows on different surfaces. They then investigate how to make a dark area on the surface by using different materials to block light from reaching a surface.

Chapter 3: How do we make bright, medium bright, and dark areas in a puppet show scene?

Students figure out: Different materials let different amounts of light pass through. Bright areas are the result of all or almost all the light passing through an object and reaching a surface. This happens if there is no object or if the object is transparent. Medium-bright areas result when only some of the light passes through and reaches the surface. Dark areas happen because no light passes through an object. Light is blocked, so the surface looks dark.

How they figure it out: Students refine their understanding of how light interacts with different materials and work as light engineers to plan, make, and test shadow scenery. Based on what they learn, students revise their own shadow scene to meet a set of design goals. Students write explanations of their scenes for the puppet-show company.

Chapter 4: How do we design a sound source to go with a puppet show scene?

Students figure out: Sound has a source, just like light does. Sound is made when an object vibrates. The object that vibrates is the source of the sound. Like light, sound also travels. Sound travels from the source to our ears. You can start and stop sound by starting and stopping the vibration of an object.



How they figure it out: Working as sound engineers, students hunt for sound sources, investigate how sounds are made, and explain what vibrates in a particular sound source. They plan, make, and test different ways of making sound effects. They read a book about sound and share what they learn in a mini-book they create for the puppet-show company.



Progress Build

A Progress Build describes the way in which students' explanations of the central phenomenon should develop and deepen over the course of a unit. It is an important tool in understanding the design of the unit and in supporting students' learning. A Progress Build organizes the sequence of instruction, defines the focus of the assessments, and grounds inferences about students' understanding of the content, specifically at each of the Critical Juncture Assessments found throughout the unit. A Critical Juncture is the differentiated instruction designed to address specific gaps in students' understanding. This document will serve as an overview of the *Light and Sound: Puppet-Theater Engineers* Progress Build. Since the Progress Build is an increasingly complex yet integrated explanation, we represent it below by including the new ideas for each level in bold. Depending on the standards for a given grade level, a unit may include additional supporting content; however, the Progress Build serves as the conceptual core of the unit.

In the *Light and Sound* unit, students will learn to construct scientific explanations of how light from a single light source interacts differently with different materials to produce areas with varying levels of brightness. In addition to the ideas in the Progress Build, students learn that when audible sound is heard, it is because part of the sound source is vibrating.

Prior knowledge (preconceptions): There is no significant prior knowledge assumed. Students have likely had some direct or indirect experience with turning on and off overhead lights, lamps, or flashlights. They may also have some experience observing or creating shadows.

Progress Build Level 1: Light from a source makes surfaces visible and look brighter.

Anything that is visible has light getting to it from a source. If no light from a source is present, there is no light to get to anything, so nothing is visible (you can't see anything). When light from a source gets to a surface, it looks brighter than without the light.

Progress Build Level 2: Some materials can block light from reaching a surface.

Anything that is visible has light getting to it from a source. If no light from a source is present, there is no light to get to anything, so nothing is visible (you can't see anything). When light from a source gets to a surface, it looks brighter than without the light. **If an object is between the source and a surface, the light from the source may not pass through, and the surface is not as bright (darker) as when the light reaches it.**

Progress Build Level 3: Some materials allow all or some light to pass through them.

Anything that is visible has light getting to it from a source. If no light from a source is present, there is no light to get to anything, so nothing is visible (you can't see anything). When light from a source gets to a surface, it looks brighter than without the light. If an object is between the source and a surface, the light from the source may not pass through, and the surface is not as bright (darker) as when the light reaches it. **Different materials can allow different amounts of light to pass through them to reach a surface beyond. They can allow almost all light, some light, or no light to pass through. If they allow some light through, the surface looks brighter, but not as bright as with all the light.**

Chapters at a Glance

Unit Question

How do we make different parts of a surface brighter or darker?

Chapter 1: How do we make brighter or darker areas?

Chapter Question

How do we make brighter or darker areas?

Investigation Questions

- What makes something look bright or dark? (1.2, 1.5)
- Where does the light come from that makes surfaces look bright or dark? (1.3, 1.4)
- What makes a surface look bright or dark? (1.5)

Key Concepts

- Light makes things look bright. (1.2)
- You need some light to see. (1.2)
- All light comes from a source. (1.4)
- When light from a source gets to a surface, the surface looks bright. (1.5)

Chapter 2: How do we make a dark area in a bright puppet show scene?

Chapter Question

How do we make a dark area in a bright puppet show scene?

Investigation Questions

- How do we stop light from getting to one part of a surface? (2.1, 2.2, 2.3)

Key Concepts

- When light is blocked by an object, the surface behind the object looks dark, and we call this a shadow. (2.2)
- When light is blocked by a material, the surface behind the material looks dark, and we call this a shadow. (2.3)

Chapter 3: How do we make bright, medium bright, and dark areas in a scene?**Chapter Question**

How do we make bright, medium bright, and dark areas in a puppet show scene?

Investigation Questions

- How do materials make areas on a surface that are not dark? (3.1, 3.2, 3.3)

Key Concepts

- When all light passes through a material, the surface behind the material looks bright. (3.3)
- When some light passes through a material, the surface behind the material looks medium bright. (3.3)

Chapter 4: How do we design a sound source to go with a puppet show scene?**Chapter Question**

How do we design a sound source to go with a puppet show scene? (4.1)

Investigation Questions

- What happens when something starts making a sound? (4.1, 4.2, 4.3)
- How do we make different vibrations to make different kinds of sounds for our puppet show scenes? (4.4)

Key Concepts

- All sound comes from a source. (4.1)
- A source makes a sound because part of it is vibrating. (4.3)

Guided Unit Internalization Planner

Part 1: 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?	

Part 2: Chapter internalization

Complete the tables below using information in the Lesson Overview Compilation.

	Chapter 1	Chapter 2
This chapter mostly focuses on...		
Important science concepts students learn include...		

	Chapter 3	Chapter 4
This chapter mostly focuses on...		
Important science concepts students learn include...		

Part 3: Key routines and activities

As the presenter talks through the unit, use this table to make space about key routines and activities.

Key routine or activity	Notes

@Home Resources Scavenger Hunt

Directions: Use this scavenger hunt to practice navigating the Program Hub and decide which @Home Resources best supports your current instructional needs.

Part 1: @Home Units Task	Notes
Navigate to the @Home Unit resources. <ul style="list-style-type: none"> Select Remote learning: Amplify Science @Home Select Grade-level resources → Grade-level → Unit 	
How long is each @Home lesson? Hint: Teacher Overview	
Which types of activities are recommended for synchronous and in-person learning? Hint: Teacher Overview	
How many @Home lessons are in Chapter 1 of your unit? Hint: Teacher Overview	
In which lesson is your unit's phenomenon introduced? Hint: Teacher Overview	
How does the @Home Packet for Lesson 1 differ from the @Home Slides for that same lesson? Hint: Student Materials	
When would you use @Home Student Sheets? Hint: Teacher Overview	
How does the @Home Family Overview support caregivers? Hint: Family Overview	
Part 2: @Home Videos Task	Notes
Navigate to the @Home Unit resources. <ul style="list-style-type: none"> Select Remote learning: Amplify Science @Home Select Grade-level resources → Grade-level → Unit Scroll down to the @Home Video Playlist Select the lesson in which the problem or phenomenon is introduced 	
Describe the phenomenon (or observable event, something that students can see or experience) in your unit.	

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