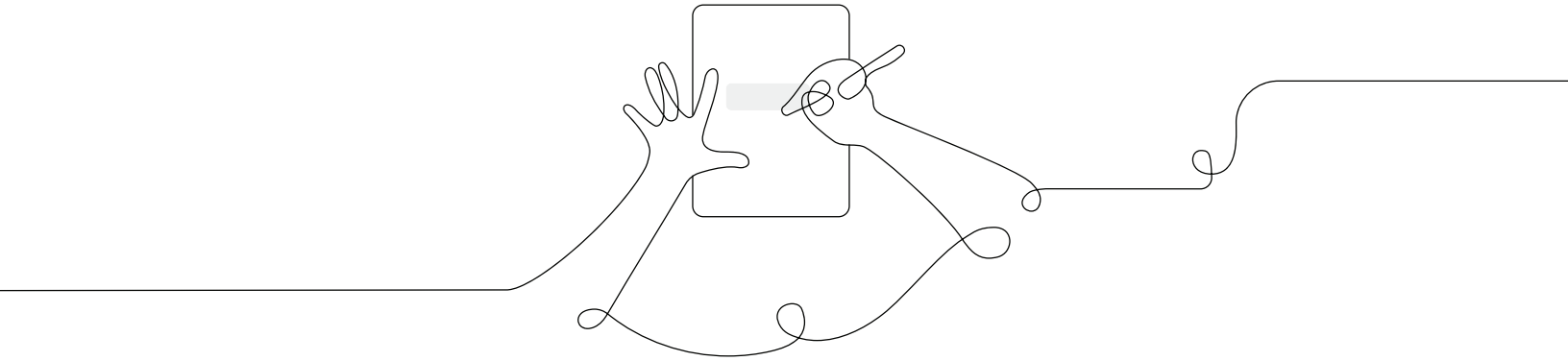
Amplify Science

# Participant Notebook

## Assessment System

**Grade** 1



# Assessment System

## Agenda

**Introduction**

- Framing

**Assessment System**

- Overview

**Progress Build**

- Analysis
- Group Work Time

**Assessments**

- Pre-UnitAssessments
- Formative Assessments
- End of Unit Assesment

**Model Lesson**

**Planning**

**Closing**

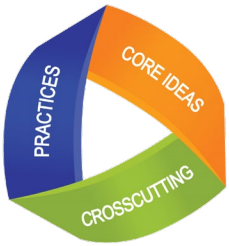
**Demo account for your workshop:**

URL: **learning.amplify.com** (Log in with Google)

Temporary username: _____ **@pd.tryamplify.net**

Password: _____

# Three dimensional learning reference




3-D learning engages students in using scientific and engineering practices and applying crosscutting concepts as tools to develop understanding of and solve challenging problems related to disciplinary core ideas.

## Science and Engineering Practices

1. **Asking Questions and Defining Problems**
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 and Designing Solutions**
7. **Engaging in Argument from Evidence**
8. **Obtaining, Evaluating, and Communicating Information**

## Disciplinary Core Ideas

**Earth and Space Sciences:**
- Earth's Place in the Universe
- Earth's Systems
- Earth and Human Activity

**Life Sciences:**
- From Molecules to Organisms
- Ecosystems
- Heredity
- Biological Evolution

**Physical Sciences:**
- Matter and its Interactions
- Motion and Stability
- Energy and their Applications

**Engineering, Technology and the Applications of Science:**
- Engineering Design
- Links among Engineering Technology, Science and Society

## Crosscutting Concepts

1. **Patterns**
2. **Cause and Effect**
3. **Scale, Proportion, and Quantity**
4. **Systems and System Models**
5. **Energy and Matter**
6. **Structure and Function**
7. **Stability and Change**

# Reflection

Use the provided spaces as a place for reflection throughout the session.

## Session goals and student outcomes

| What<br>Connect the workshop goal(s) to an outcome you envision for your students. | Why<br>Reflect on why you want this outcome for your students. | How<br>How will your students achieve the outcome? Reflect on what you learned during the workshop that will impact student outcomes. |
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## Triangle – Circle – Square reflection

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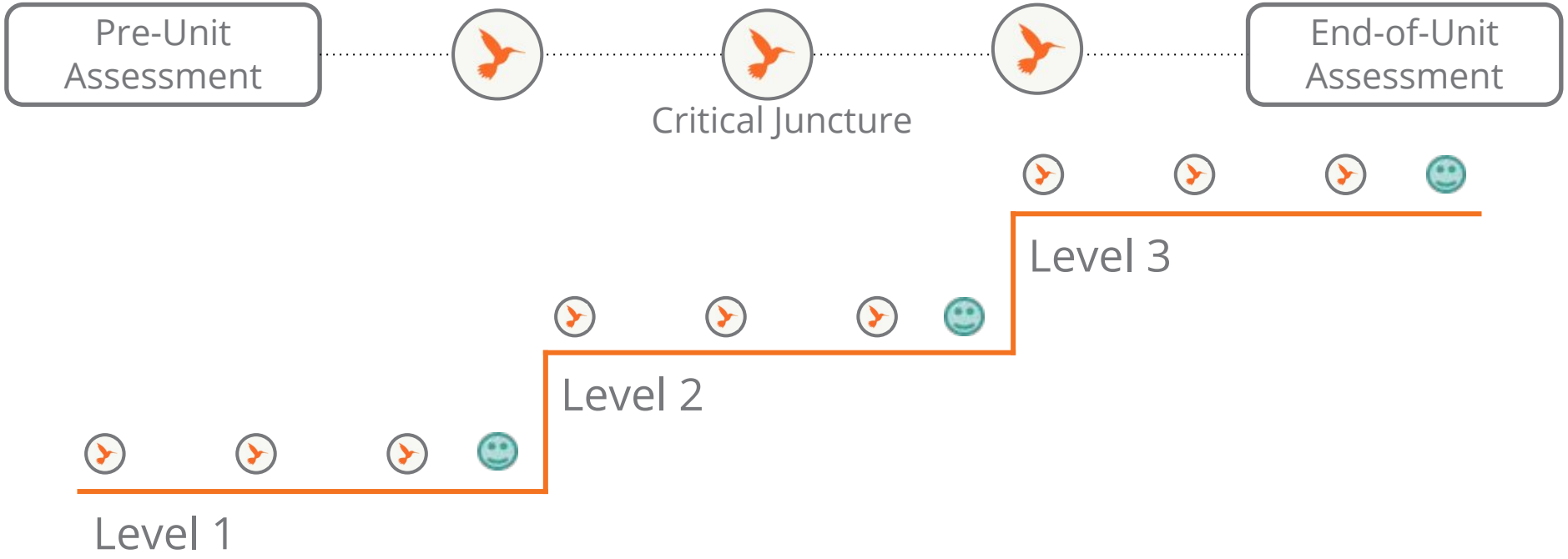
# K-5 Assessment System



# Assessment System reference (grades K-1)

| Assessment type | Description | Student experience | Teacher resources |
|---|---|---|---|
| **Pre-Unit Assessment** | Formative, 3-D performance assessment meant to gauge students' initial understanding and pre-conceptions about core ideas in the unit | • Full-class teacher-led discussion, supported by visual cues | • Assessment Guide (available in Digital Resources) |
| **End-of-Unit Assessment** | Summative, 3-D performance assessment to evaluate students' understanding of core ideas in the Progress Build | • Full-class teacher-led discussion, supported by visual cues | • Rubric and Possible Responses in Assessment Guide (available in Digital Resources) |
| **Critical Juncture Assessments** | Embedded formative assessments for assessing students' progress along the Progress Build | • Activities are embedded into existing instructional activities leveraged for assessment opportunities – often student-to-student discussions, investigations, or modeling activities | • Full text of assessment includes "Assess Understanding" section and "Tailor Instruction" suggestions accessible in Instructional Guide by clicking the hummingbird icon<br>• All Critical Juncture Assessments are included in Reference: Embedded Formative Assessments (available in the Unit Guide)<br>• Clipboard Assessment Tool includes tailored sets of questions and the specific activities that present an opportunity to ask those questions. Also included is space to write notes about students' ideas.<br>• Augmenting Instruction notes (accessible in Teacher Support tab) provide additional suggestions for supplemental instruction at the class, group, and student level |
| **On-the-Fly Assessments** | Embedded formative assessments for noting students' progress with one or more of the following: science disciplinary core ideas, science and engineering practices, crosscutting concepts, sense-making strategies, and collaborative science work | • Activities are embedded into existing instructional activities, leveraged for assessment opportunities. Artifacts can include full-class or student-to-student discussion, kinesthetic activities, notebook pages, etc. | • Full text of assessment includes what to "Look for" and "Now What?" instructional suggestions accessible in Instructional Guide by clicking the hummingbird icon<br>• All On-the-Fly Assessments are included in Reference: Embedded Formative Assessments (available in the Unit Guide)<br>• Clipboard Assessment Tool includes tailored sets of questions and the specific activities that present an opportunity to ask those questions. Also included is space to write notes about students' ideas. |

## Assessment System reference (grades K-1) cont.

| Assessment type | Description | Student experience | Teacher resources |
|---|---|---|---|
| **Student Self-Assessments** | Opportunity for students to reflect on whether they understand or don't yet understand the core concepts from the unit | • Reflection prompts through teacher-led discussion and partner talk<br>• Provided at or near the end of each chapter | • Information about Student Self-Assessments in Reference: Assessment System (in Unit Overview)<br>• Teacher Support Notes accessible in Instructional Guide by clicking the Teacher Support tab<br>• Discussion prompts in the Instructional Guide |
| **Investigation Assessments** | Summative, 3-D performance assessment to evaluate students' performance of the science and engineering practices of Planning and Carrying Out Investigations and Analyzing and Interpreting Data, as well as their application of disciplinary core ideas and crosscutting concepts | • Prompts for planning investigation and recording results in the Investigation Notebook or a copymaster (available in Digital Resources). Additional support and spoken teacher prompts in K-1.<br>• Physical materials for conducting investigation | • Rubrics and Possible Responses in Assessment Guide (available in Digital Resources)<br>• Possible Responses also accessible in Instructional Guide by clicking the Possible Responses tab |
| **Portfolio Assessments** | Opportunity for students to compile and reflect on key work products collected at the end of each unit. Final portfolio compilation occurs at the end of the school year and allows students to select and reflect on work products which they feel best demonstrate their growth in understanding throughout the year | • Compilation of work products that show growth over the course of the year<br>• Reflection on chosen work products<br>• Rubrics for evaluating work products (available in Program Guide → *Assessments* → *Additional Assessment Resources*) | • Assessment Rubrics (available in Program Guide → *Assessments* → *Additional Assessment Resources*)<br>• Guidance for communicating to parents about student progress (available in Program Guide → *Assessments* → *Additional Assessment Resources*) |

# 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.**

# Progress Build Analysis

**Directions:**

1. Open the Progress Build document in the Planning for the Unit section of the Unit Guide.
2. **START WITH THE BOX AT THE BOTTOM OF THIS PAGE,** and summarize each Progress Build level. Feel free to draw if that's more helpful.
3. In between the provided boxes, reflect on how the ideas build from one level to the next by answering the two questions given.

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## Level 3

What new ideas are added in level 3?

How do those new ideas build on and connect to level 2?

## Level 2

What new ideas are added in level 2?

How do those new ideas build on and connect to level 1?

## Level 1

## Level 0 (preconceptions/prior knowledge)

## Chapter 1: Clipboard Assessment Tool

**Progress Build Level 1:** 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.

| Question to ask students | Students who understand . . . |
|---|---|
| Lesson 1.5, Activity 1:<br>Why do you think pointing the flashlight at _____ makes it look brighter? | should describe light from the flashlight as getting to/hitting/shining on the surface. |

| Student's name | Notes |
|---|---|
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# Amplify Science sample assessment data collection tool

**Grade :**
Lesson ____

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**Look for 1:**

**Look for 2:**

| Student Name | Look for 1 | Look for 2 | Notes |
|---|---|---|---|
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Light from the _____ gets to the _____, so it looks _____.

Light from the _____ does not get to the _____, so it looks _____.

**flashlight**

**wall**

**bright** (1.4)

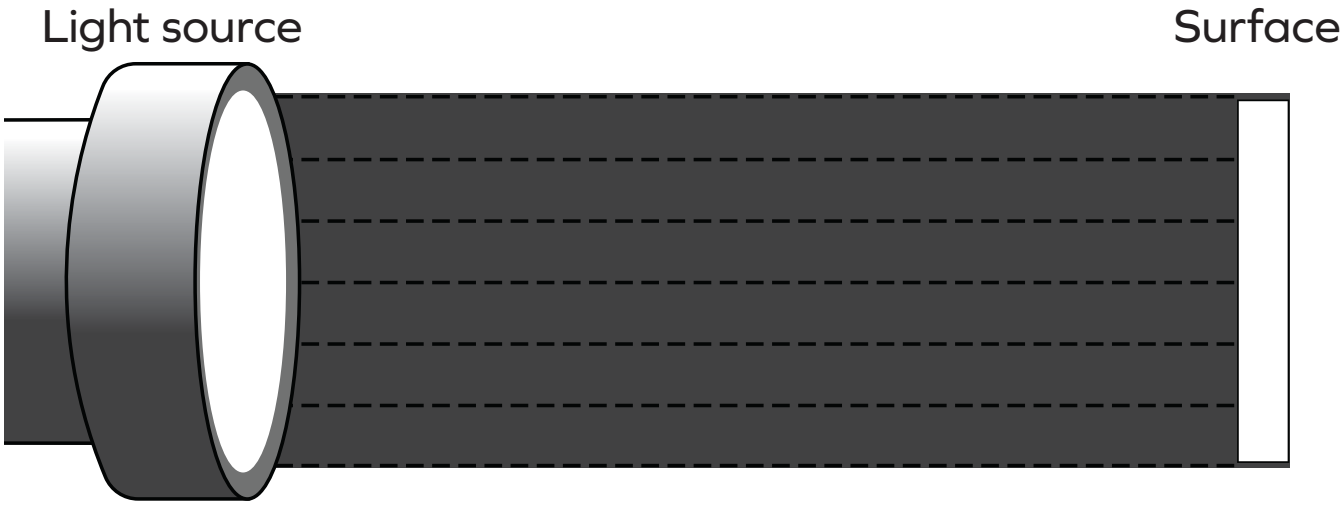
**dark**

Name: _____ Date: _____

# Diagramming Light on a Surface

Directions:

1. Complete the first diagram to show a bright surface.
2. Complete the second diagram to show a dark surface.




**Rubric 1: Assessing Students' Understanding of Science Concepts in the Unit**

Rubric 1 (on the next page) focuses on students' explanations of how their stencils create different areas of brightness on the surface and how their explanations reflect an understanding of the disciplinary core ideas in the unit. Rubric 1 is designed to guide the teacher in making inferences when assessing students' understanding and may be used summatively to gauge students' levels of understanding of science concepts from the unit.

If you would like to score students' explanations for grading purposes, we recommend using a 5-point scale (0–4). An explanation that provides an accurate and sufficient response to each question listed in the rubric should score a 4. An explanation that does not provide an accurate response to any questions should score a 0. For explanations that provide accurate responses to some, but not all questions, assign scores from 1 to 3 at your discretion. For guidance on what could be considered an accurate explanation for each question, see the Possible Accurate Student Responses table at the end of this document.

| **Rubric 1: Assessing Students' Understanding of Science Concepts in the Unit** |
| --- |
| • Did the student describe light as coming from the light source (the flashlight)?<br>• Did the student explain the brighter and darker areas as a result of more light or less light getting to the surface?<br>• Did the student describe the opaque material as letting no light pass through (or as blocking all light)?<br>• Did the student explain that the dark area is dark because no light gets to the surface?<br>• Did the student describe the transparent material as letting all light pass through (or as blocking no light)?<br>• Did the student explain that the bright area is bright because all light gets to the surface?<br>• Did the student describe the tinted material as letting some light pass through (or as blocking some light)?<br>• Did the student explain that the medium-bright area is medium bright because some light gets to the surface? |

**Rubrics 2 and 3**

Rubrics 2 and 3 focus on students' explicit understanding of the crosscutting concept of Cause and Effect and their use of the science and engineering focal practice (evaluating a solution based on design goals), respectively. Given that students' understanding of crosscutting concepts and their dexterity with science practices develop through regular opportunities across multiple units, mastery is outside the scope of a single unit. Therefore, these two rubrics are intended to be used formatively to guide teacher feedback and future instruction rather than to produce a score or a grade.

**Rubric 2: Assessing Students' Understanding of the Crosscutting Concept of Cause and Effect**

Rubric 2 focuses on students' descriptions and identifications of an example of cause and effect (in their puppet-show scenes), which is a unifying concept in science and engineering.

| **Rubric 2: Assessing Students' Understanding of the Crosscutting Concept of Cause and Effect** |
|---|
| Did the student describe an appropriate example of cause and effect, explicitly identify both cause and effect accurately, and provide evidence to support their ideas about the cause?<br>• Did the student provide an appropriate example of cause and effect from the stencil and sufficient evidence for their ideas about the cause? (e.g., Did the student indicate the effect as the observed brightness on the surface and the cause as the interaction between the light source and the material that produced that area of brightness?)<br>• Did the student explicitly identify the cause and the effect in his/her examples? |

**Rubric 3: Assessing Students' Understanding of the Practice of Evaluating a Solution Based on Design Goals**

Rubric 3 focuses on students' evaluations of their solutions (stencils) in relation to the puppet-scene design goals.

| **Rubric 3: Assessing Students' Understanding of the Practice of Evaluating a Solution Based on Design Goals** |
|---|
| Did the student explicitly evaluate the performance of the solution (the areas on the surface created by the stencil) in relation to the design goals (the requested areas of brightness)?<br>• Did the student accurately state whether the solution met all the design goals?<br>• Did the student evaluate each design goal individually? (e.g., *It's supposed to make a dark area, and it does that.*)<br>• Did the student describe or point to the area that relates to the design goal(s) he/she claims was met? (e.g., *It's supposed to make a dark area, and the mountain is dark*.) |

(continued on next page)

| Possible Accurate Student Responses |
| --- |
| If the student does not explain the dark area, point to it.<br>• *Why does this area of the surface look dark?*<br>It looks dark because the material blocks all the light from the flashlight, and no light gets to the wall, so it looks dark.<br>If the student does not explain the medium-bright area, point to it.<br>• *Why does this area of the surface look medium bright?*<br>It looks medium bright because the material lets some of the light pass through, and some light gets to the wall, so it looks medium bright.<br>**Responses to follow-up questions:**<br>If the student does not mention the flashlight as the source of light.<br>• *Light is getting to different areas of this surface. Where is that light coming from?*<br>The flashlight. The light source.<br>If the student does not mention the different amounts of light getting to one or more parts of the surface, point to the bright, dark, and medium-bright areas, one at a time.<br>• *How much light from the source is getting to this bright area of the surface?*<br>All or almost all the light.<br>• *How much light from the source is getting to this dark area of the surface?*<br>None of the light, no light.<br>• *How much light from the source is getting to this medium-bright area of the surface?*<br>Some light.<br>If the student does not mention the different materials allowing different amounts of light through each material, point to the opaque material, the transparent material, and the tinted material, one at a time.<br>• *How much light gets through this (opaque) material? How do you know it does that?*<br>None of it. It all gets blocked. The area behind the material is dark.<br>• *How much light gets through this (transparent) material? How do you know it does that?*<br>All of it. None gets blocked. The area behind the material is bright.<br>• *How much light gets through this (tinted) material? How do you know it does that?*<br>Some of it. Some of it gets blocked. The area behind the material is medium bright. |

| Possible Accurate Student Responses |
| --- |
| **Crosscutting Concept: Cause and Effect**<br>Prompt the student to give an example of cause and effect in the scene. Remind the student that cause and effect means when one thing happens, something else happens.<br>• *As we have been learning about light, we have been talking about cause and effect. It means when one thing happens, something else happens.*<br>• *Look at the stencil projecting the scene on the surface. What is an example of cause and effect here?*<br>The surface looks bright, because the material lets all the light pass through. The material lets some light pass through, so the surface looks medium bright. The surface looks dark, because all the light is blocked by the material. OR: The stencil does different things to light, so we see different areas on the wall.<br>• *In your example, what is the cause and what is the effect?*<br>The cause is the material letting only some light pass through it. The effect is the medium-bright area that we see on the surface.<br>**Science and Engineering Practice: Evaluating a Solution Based on Design Goals**<br>Prompt the student to evaluate the solution (stencil) based on the design goals. Point to the Puppet Scene Design Goals chart and remind the student that the scene should have a bright area, a dark area, and a medium-bright area.<br>• *The puppet-theater company asked us to design a scene that meets three design goals. The scene should have a bright area, it should have a dark area, and it should have a medium-bright area.*<br>• *Does this solution (stencil) meet the puppet-theater company's design goals? Why or why not?*<br>Yes, it meets all three design goals because you can see a bright area, a dark area, and a medium-bright area on the surface. |

# Additional Amplify resources

## Program Guide

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

You can find your Program Guide through the Program and Apps menu, which is located in the top right corner of your screen. The Program Guide icon can be found under the "Other Resources" section.

## Amplify Help

Frequently updated compilation of articles with advice and answers from the Amplify team.

my.amplify.com/help

## Caregivers Site

https://amplify.com/science-caregivers

# Amplify Support

Contact the Amplify support team for information specific to enrollment and rosters, technical support, materials and kits, and teaching support.

Email: help@amplify.com

Email: edsupport@amplify.com (pedagogical questions)

Phone: 800-823-1969

Or, reach Amplify Chat by clicking the  icon at the bottom right of the digital Teacher's Guide.

**When contacting the support 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.

# Notes

Amplify Science