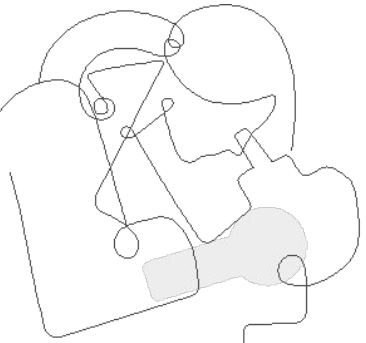
Amplify Science

The Assessment System

Grade 1, Unit 2: Light and Sound

Part 3

Strengthen workshop



Los Angeles Unified School District
12/10/2022
Jonathan Tam

PLPG CERTIFIED PROVIDER

Amplify's Purpose Statement

Dear teachers,

You do a job that is nearly impossible and **utterly essential.**

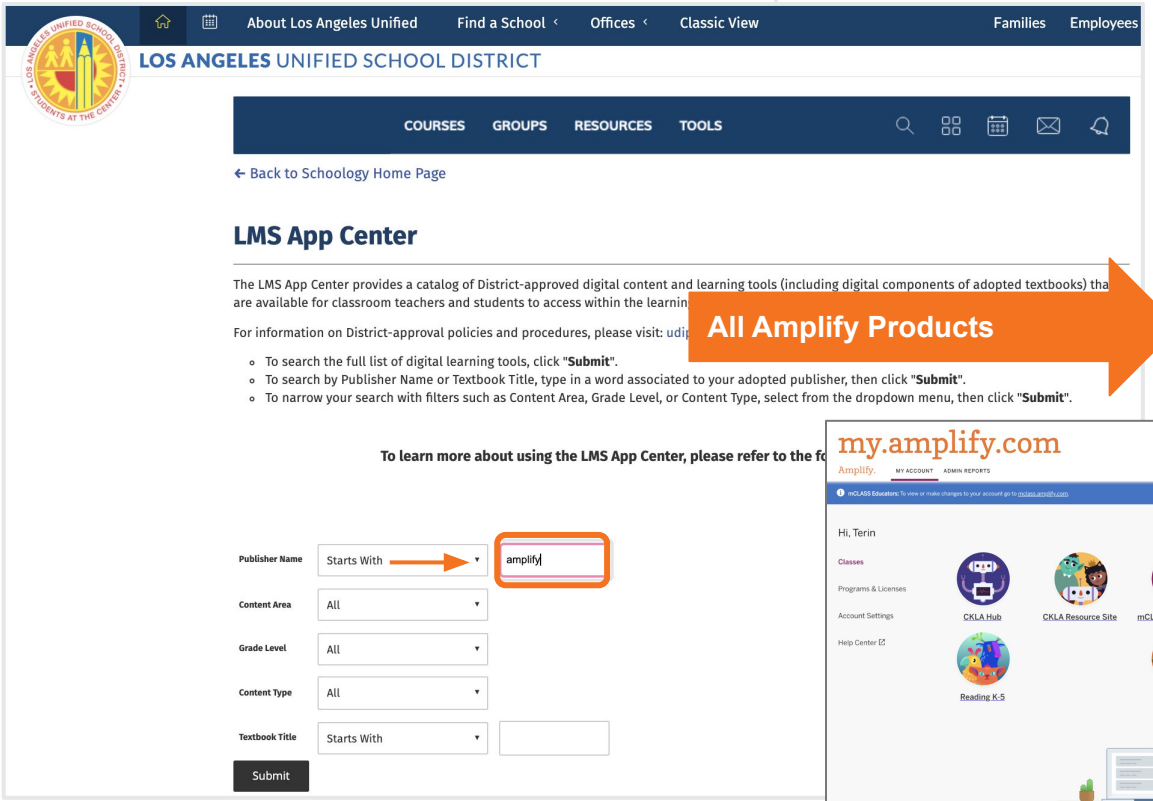
We are in your corner – extending your reach, saving you time, and enhancing your understanding of each student.

Thank you for working with us to craft rigorous and riveting learning experiences for your classroom.

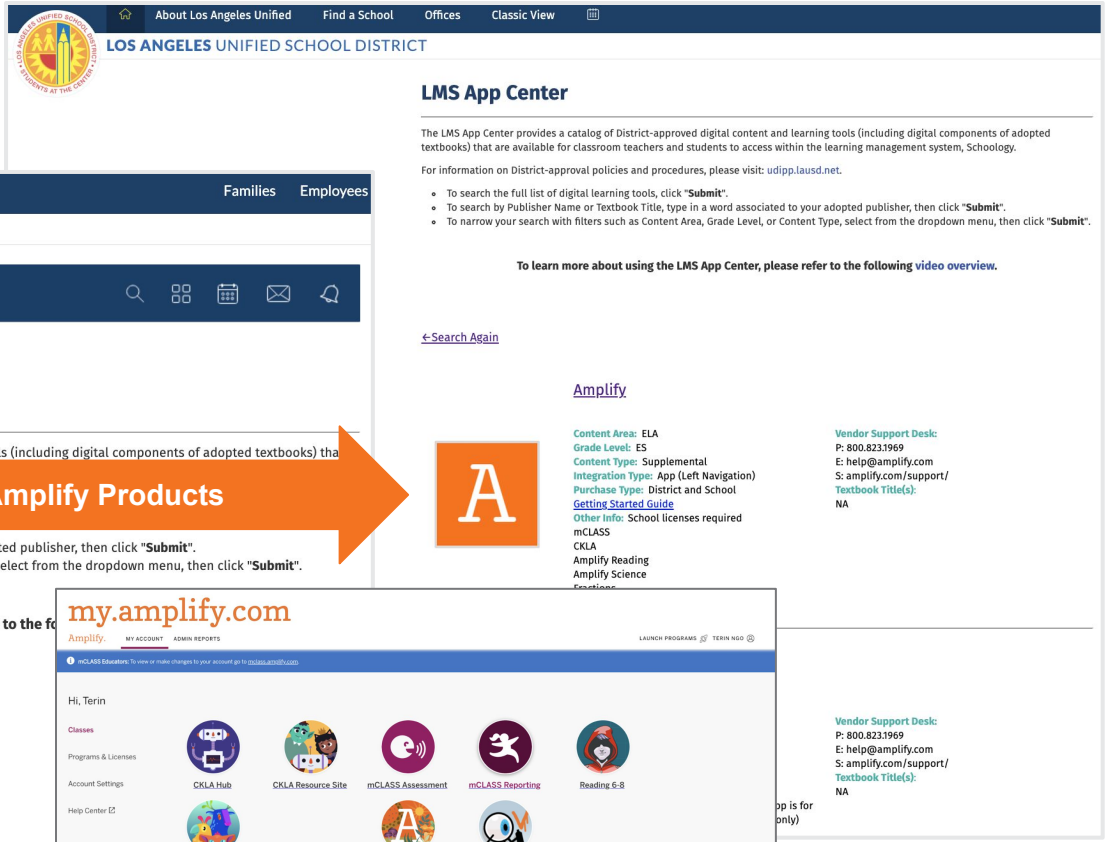
We share your goal of **inspiring all students to think deeply, creatively, and for themselves.**

Sincerely,
Amplify

Schoology



All Amplify Products



Join Amplify Science Schoology Group

To join Amplify Science Schoology ES Group: W4PK-W466-63F5B

Navigation Temperature Check

Rate yourself on your comfort level accessing Amplify Science materials and navigating a digital curriculum.

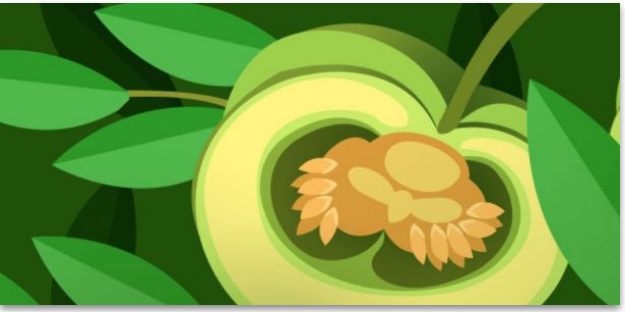
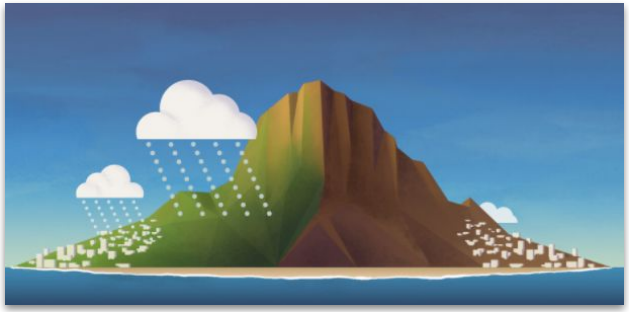
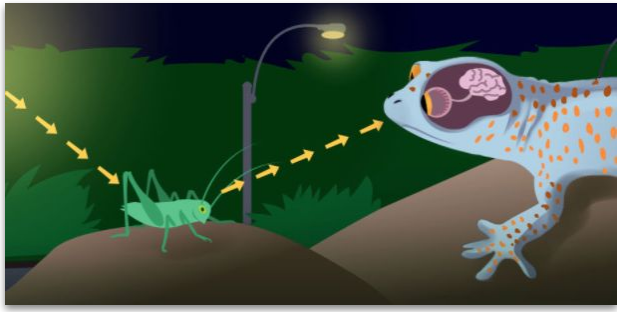
1 = Extremely Uncomfortable

2 = Uncomfortable

3 = Mild

4 = Comfortable

5 = Extremely Comfortable

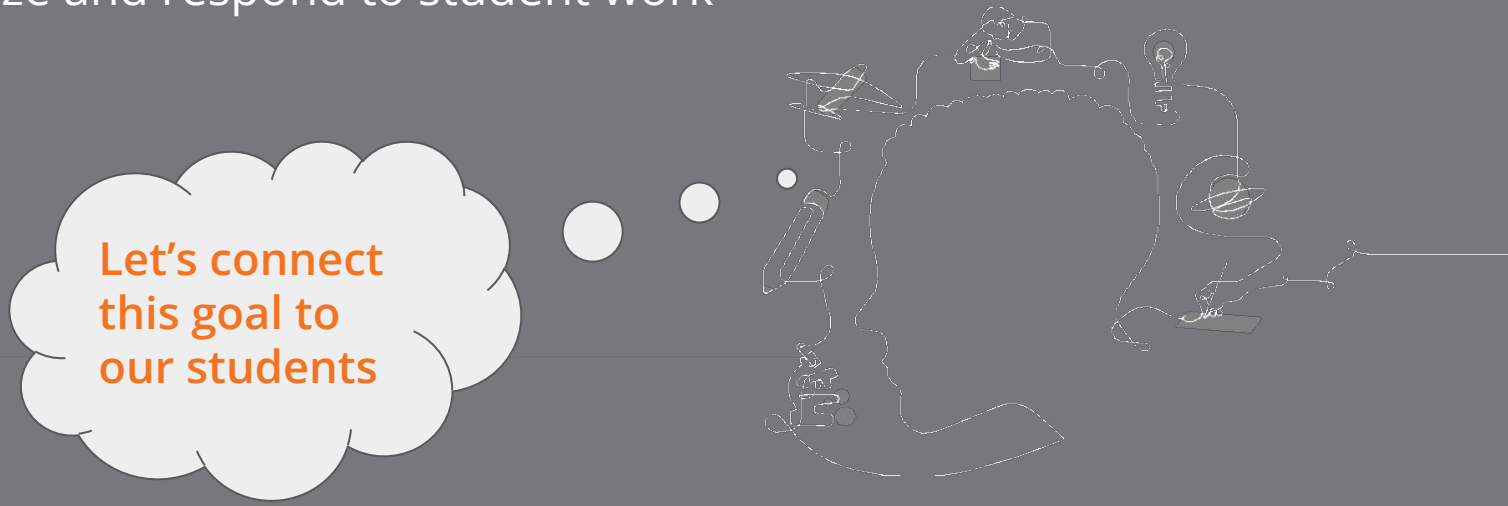




Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Overarching goals

- Describe the structure and purpose of the Amplify Science Assessment System
- Plan for the strategic use of assessment resources to analyze and respond to student work



Norms: Establishing a culture of learners

- **Take risks:** Ask any questions, provide any answers, share expertise and best practices
- **Participate:** Share your thinking, participate in discussion and reflection, put yourself in your student's shoes
- **Be fully present:** Unplug and immerse yourself in today's training.
- **Physical needs:** Stand up, get water, take breaks, bathroom*.
- **Apply your learning:** Walk away from today feeling as though you can apply things today in the future

Opening reflection

Why do we assess our students?

What is **challenging** about assessing our students?

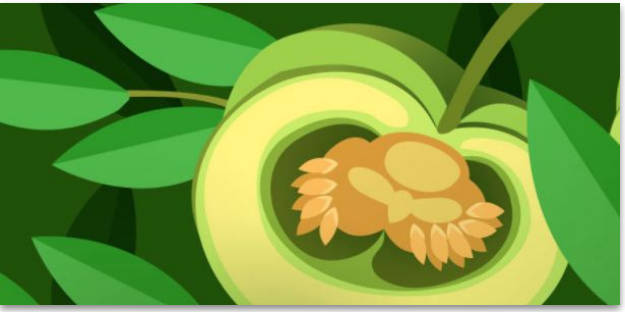
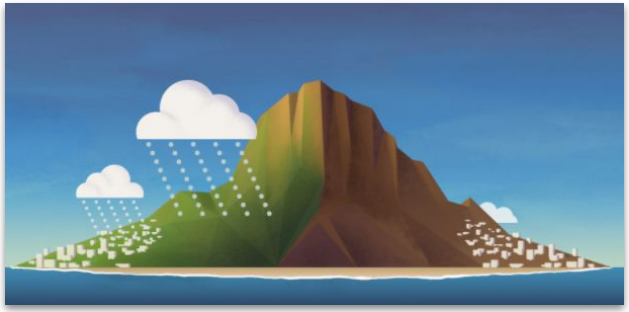
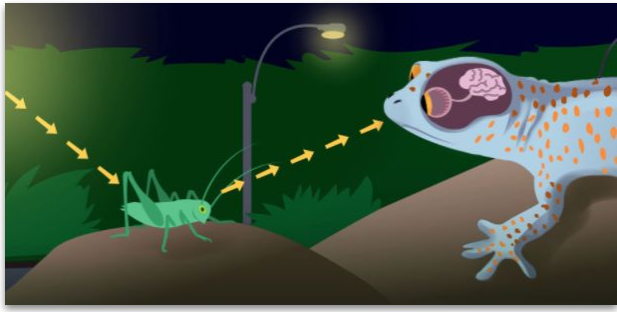
Participant Notebook

https://bit.ly/3BknJ6D

Opening Reflection: Assessment

Why do we assess our students?

Why do we assess our students?

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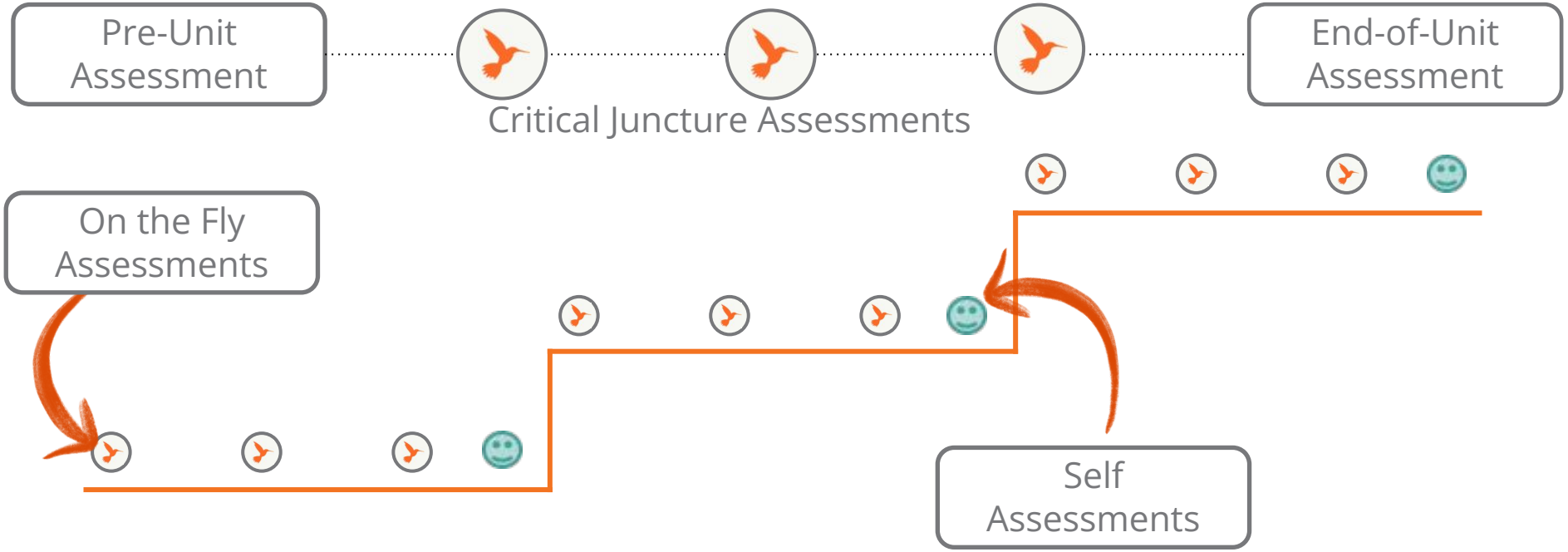
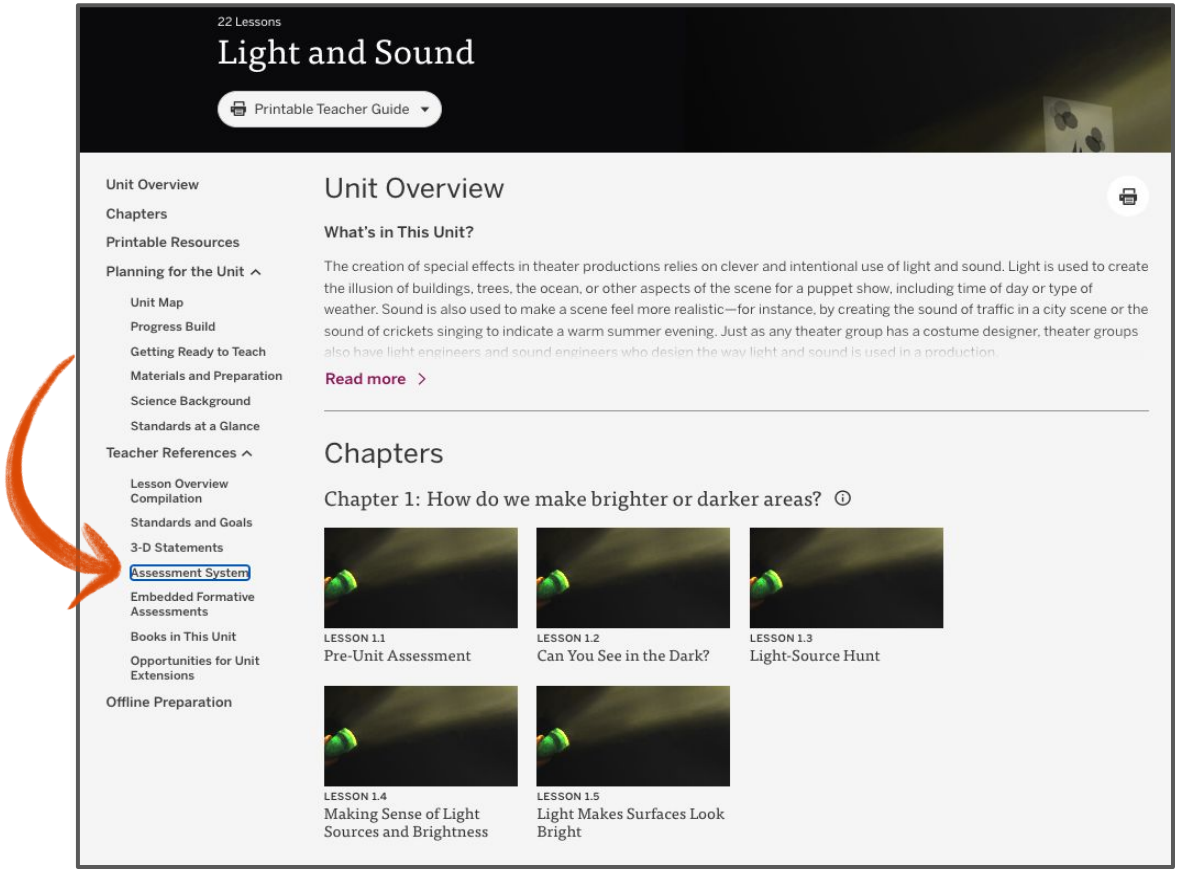
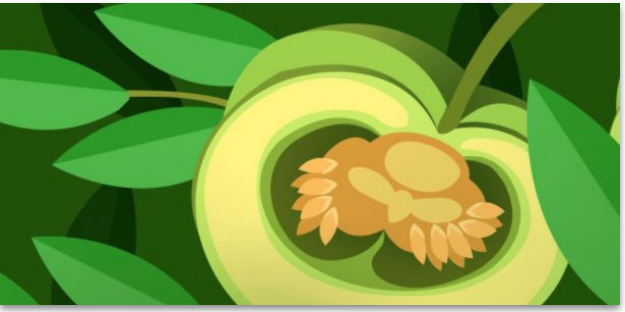
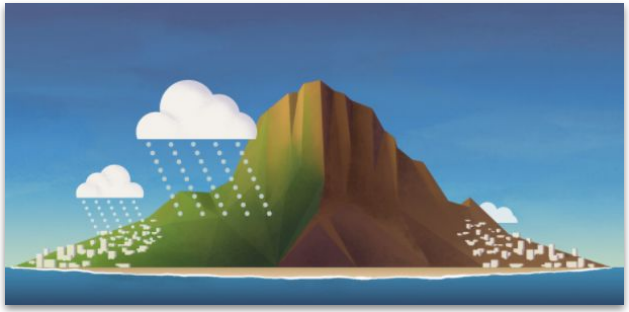
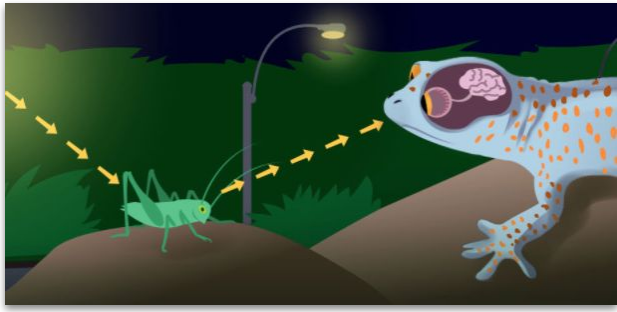
K-5 Assessment System



Assessment System Document



Questions?

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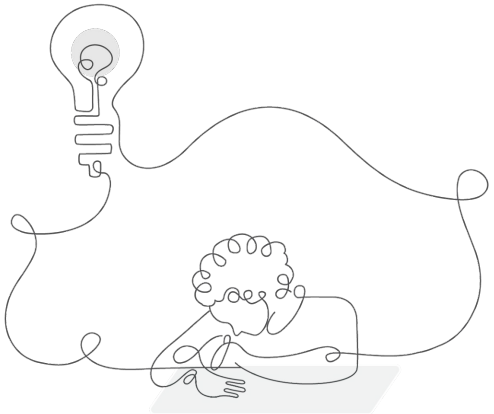
Reviewing the unit phenomenon

Light and Sound

Amplify Science units are designed around complex phenomena that drive student learning through the unit.



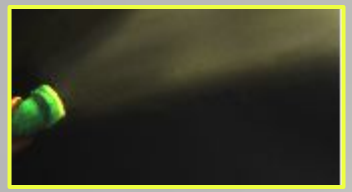
Light and Sound

Problem: **How can students use light and sound to design shadow scenery and sound effects for a puppet theater?**

Role: Light and Sound Engineer

In this unit, students will take on the role of light engineers as they are challenged with a design problem to design, build, and then project a scene for a puppet show.

Coherent Storylines



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

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

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

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

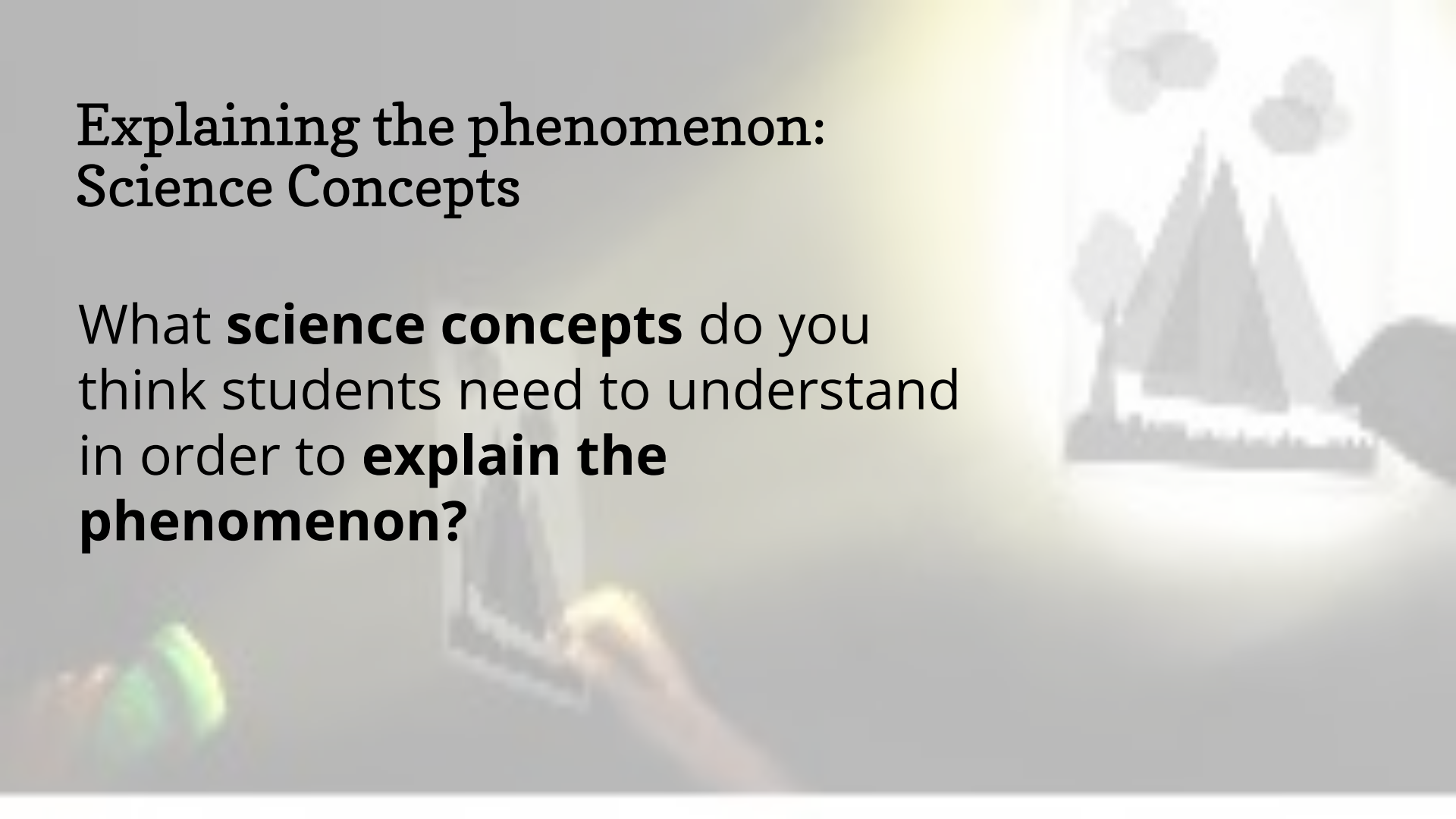
Light and Sound

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

Taking on the design problem of using light and sound to create a scene and sound sources for a puppet show provides the perfect opportunity to engage students in conducting systematic investigations, focused on predicting and testing, and in thinking deeply about cause-and-effect relationships.

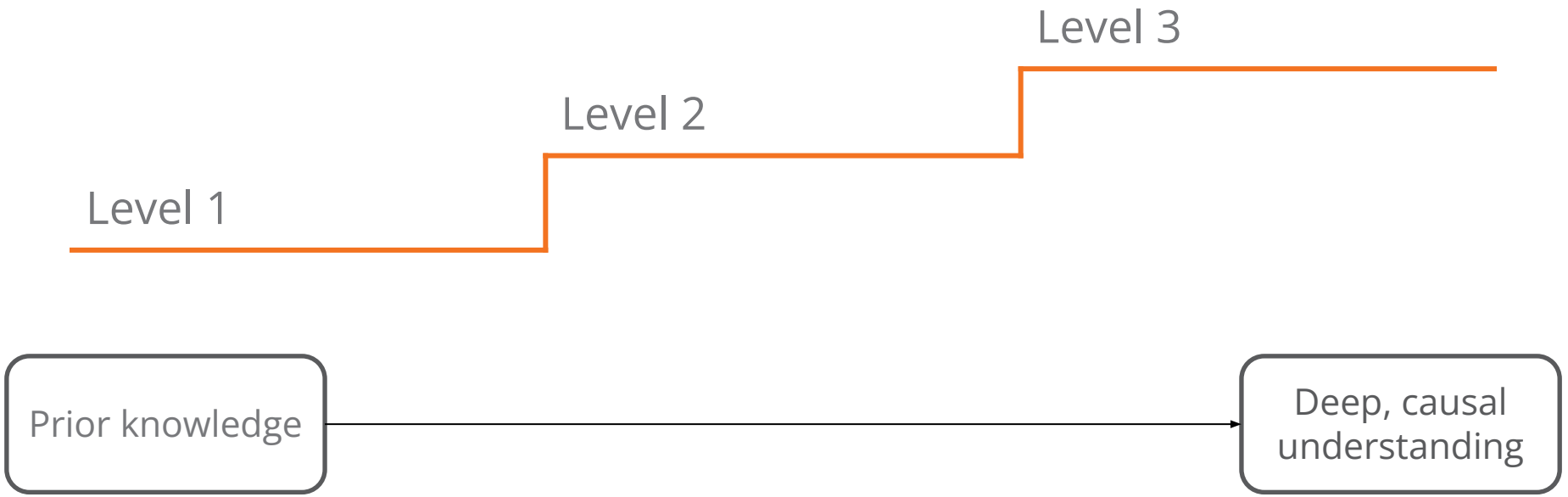
Explaining the phenomenon: Science Concepts

What **science concepts** do you think students need to understand in order to **explain the phenomenon?**



Progress Build

A unit-specific learning progression

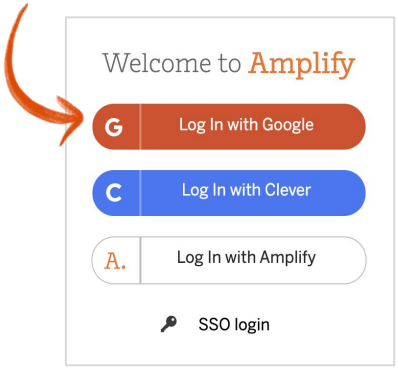


Logging in (demo account)

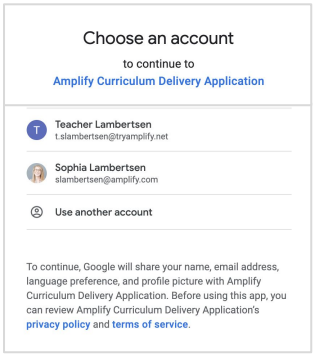
Safari or Chrome

1. Go to **learning.amplify.com**
2. Select **Log in with Google**
3. If you're already logged in with other Google accounts, click **Use another account**
4. Enter teacher demo account credentials
   - californiasci119@pd.tryamplify.net
   - AmplifyNumber1

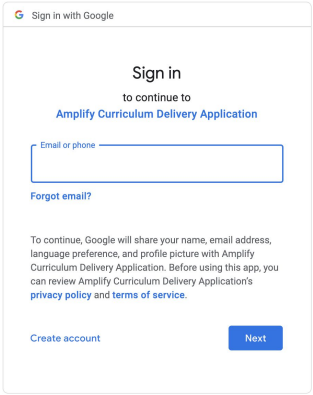
Steps 1-2

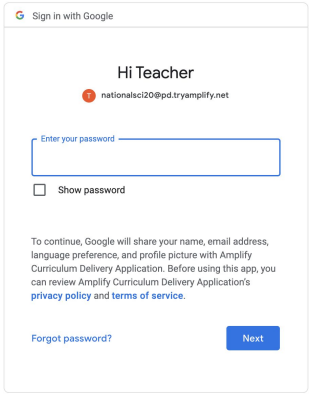


Step 3



Step 4

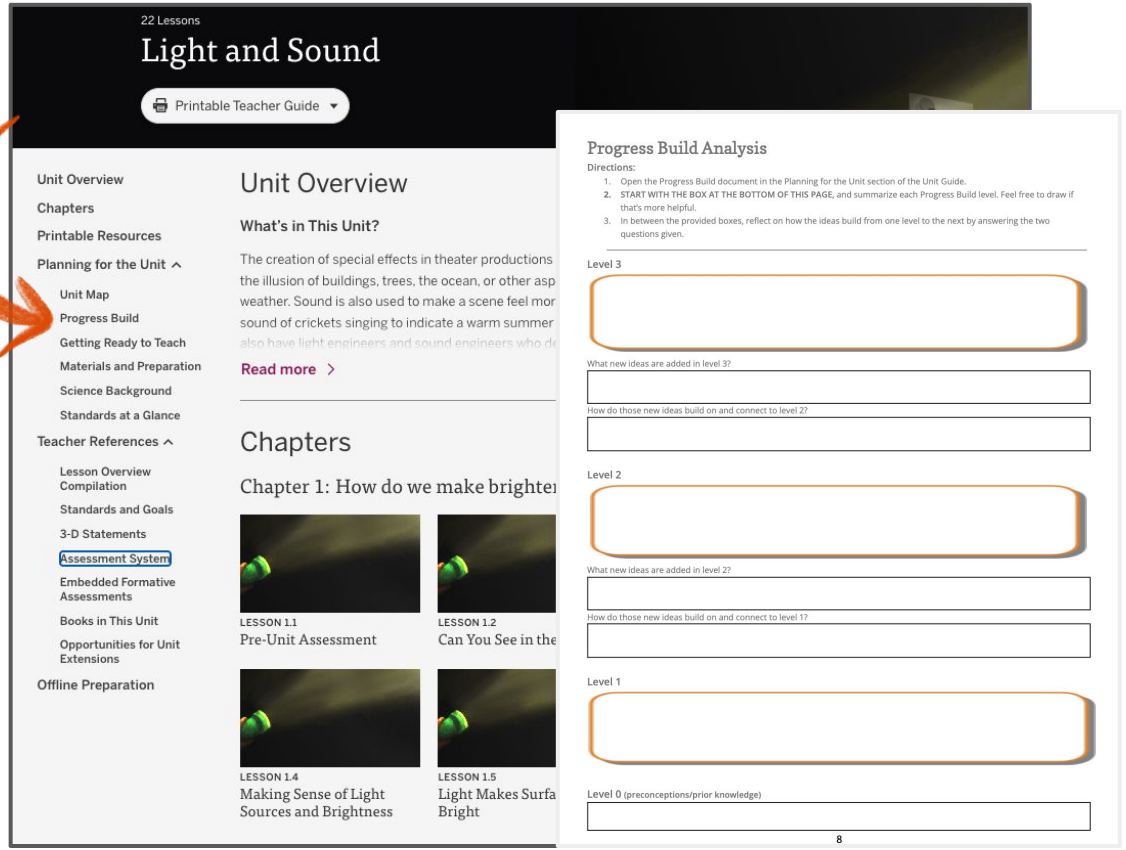




Progress Build analysis

Work time

Read and analyze your unit's Progress Build.



Progress Build analysis

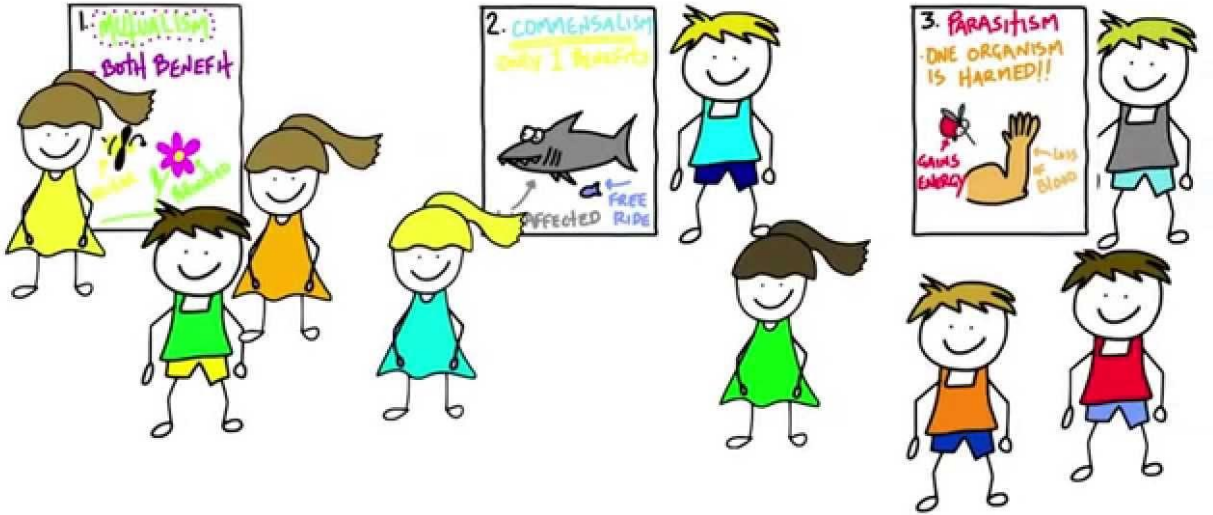
Group work time

In small groups, create a visual representation of your unit's Progress Build levels and the science concepts being taught.

Your visual representation CAN NOT include any words. Find creative ways to express students understanding at Level 1, 2 and 3

Progress Build analysis

Gallery Walk

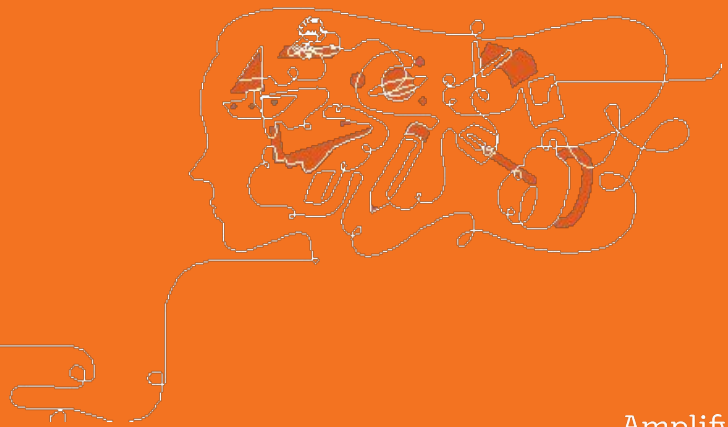


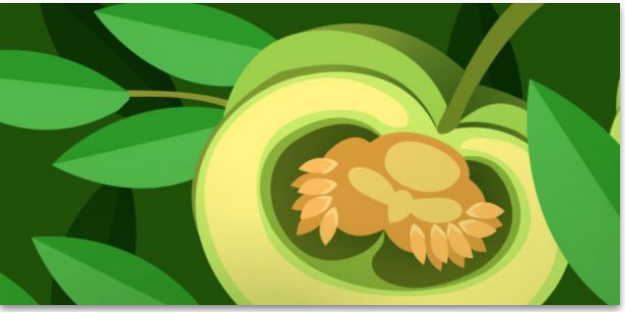
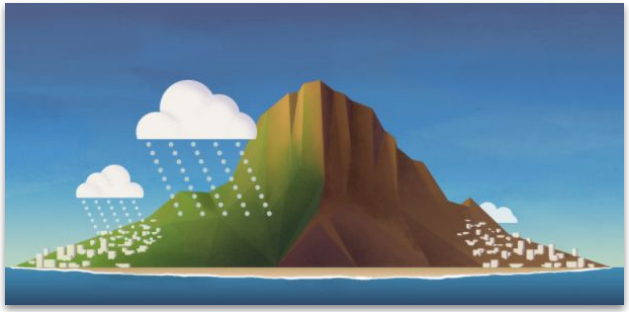
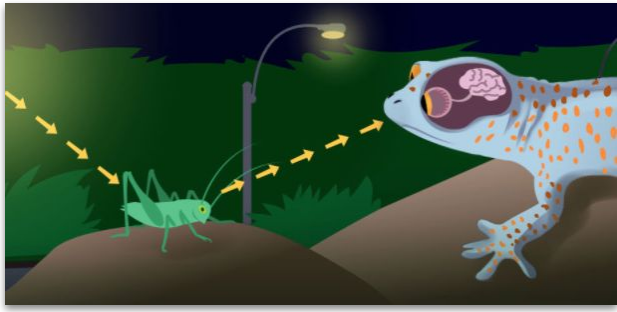
Progress Build

Light and Sound

Assumed prior knowledge (preconceptions): 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.

Break



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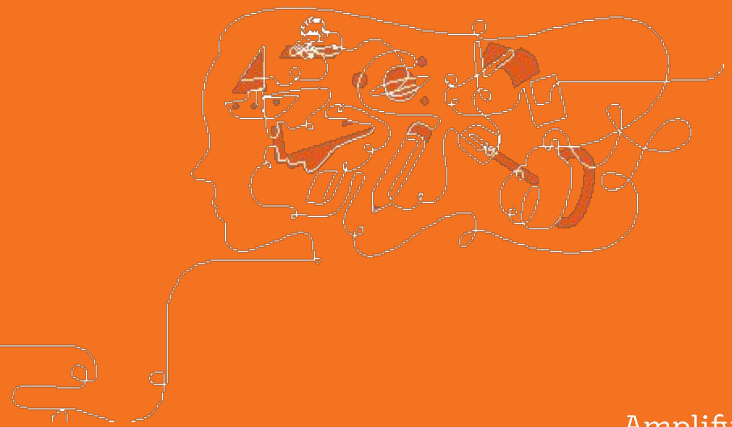
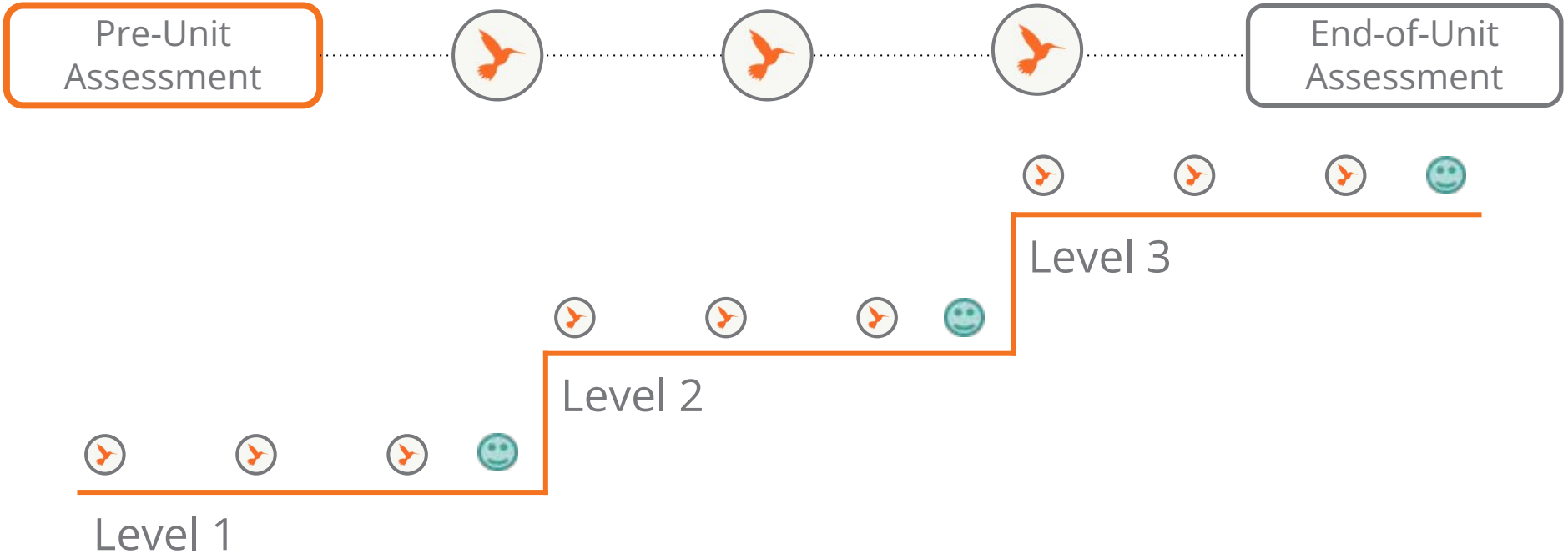
Pre-Unit Assessment



Pre and End-of-Unit Assessment



Progress Build

Light and Sound

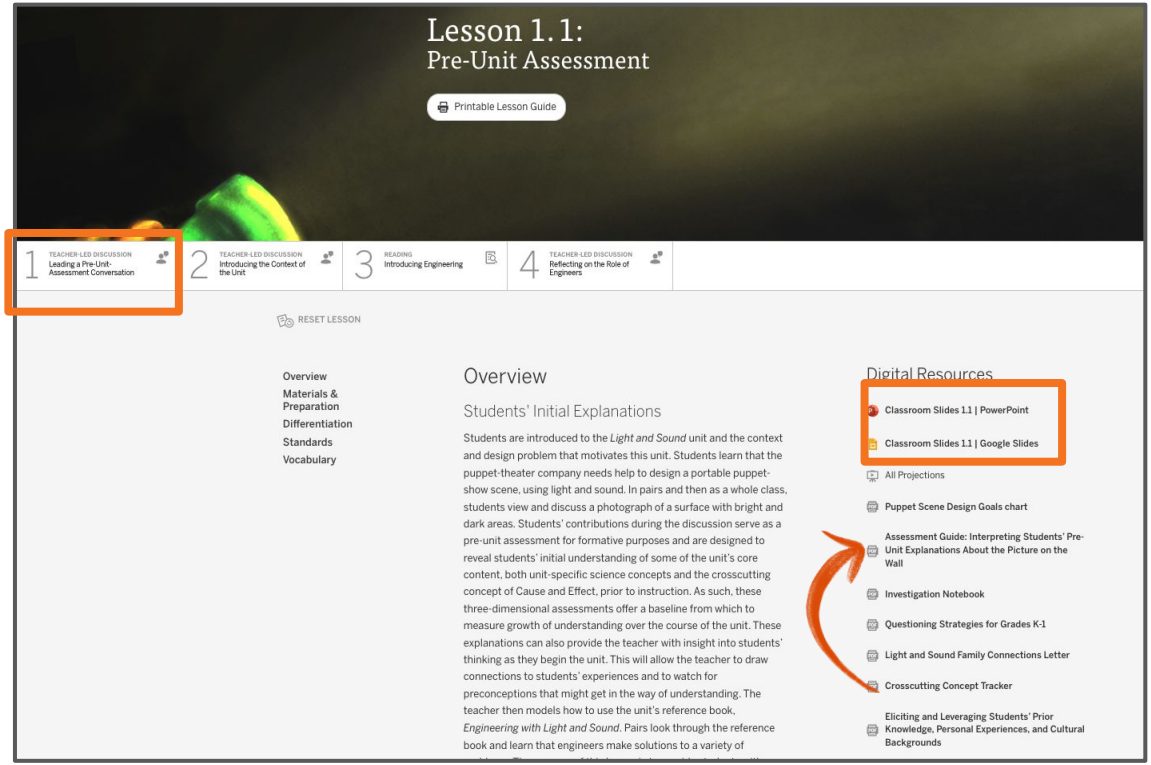
Assumed prior knowledge (preconceptions): Students have likely had some direct or indirect experience with turning on and off overhead lights, lamps, or flashlights. They may also have some experience observing or creating shadows.

Pre-Unit Assessment

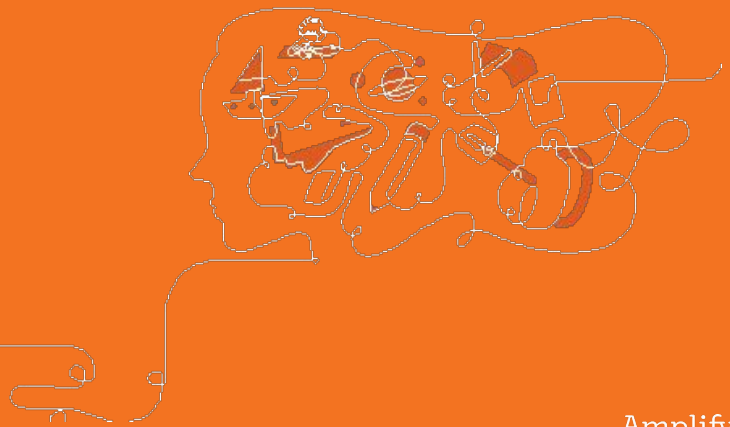
Lesson 1.1

Locate the Pre-Unit Assessment Guide in Lesson 1.1 of your unit and skim through them.

Open up the classroom slides and see how the pre-unit assessment is embedded in the lesson. Also, look at Activity 1 and read how it is explained.



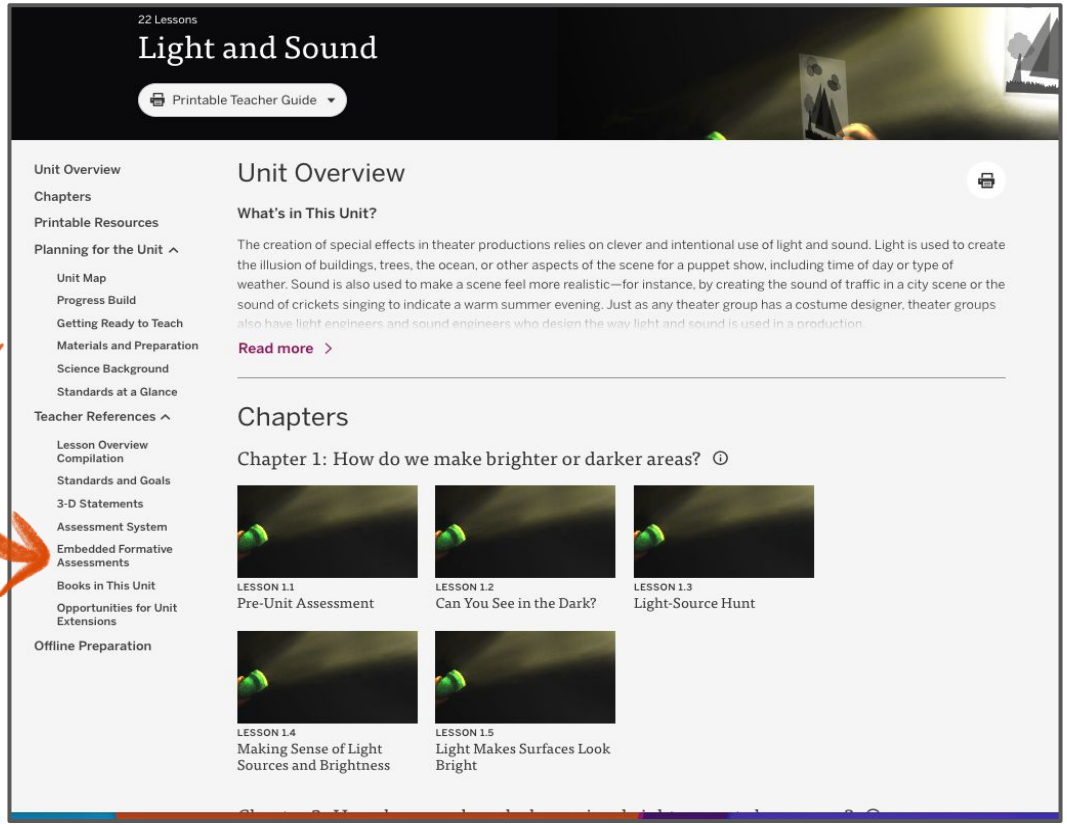
Formative Assessments



K-5 Assessment System

Formative Assessment Document

Light and Sound



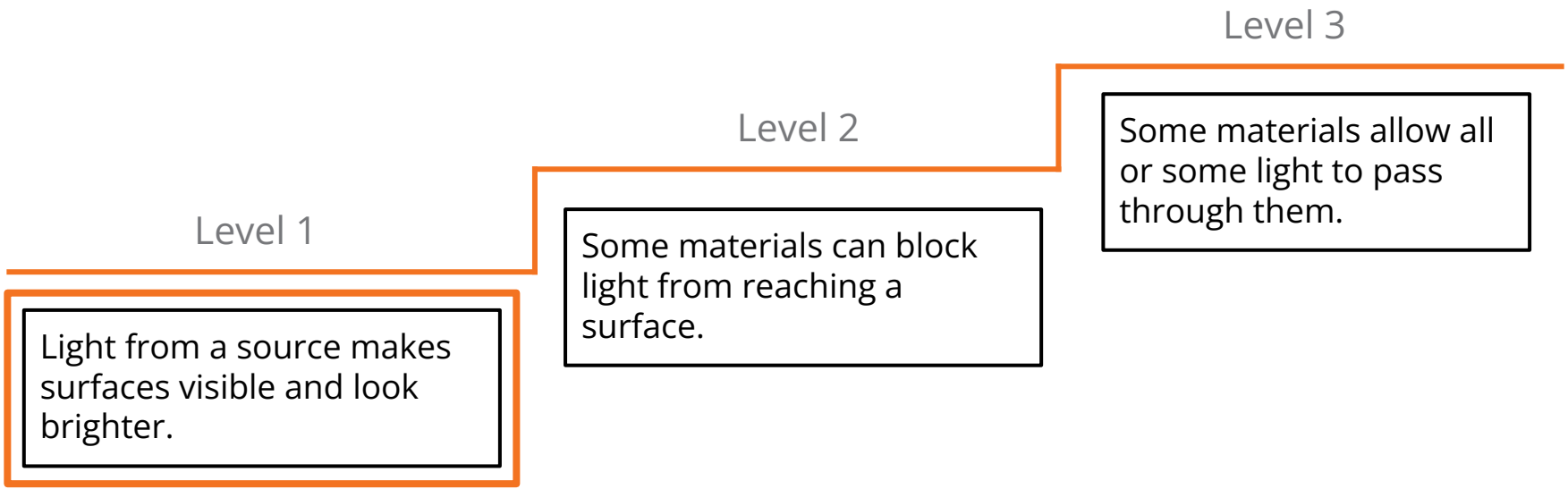
On-the-Fly Assessments

- Track student progress within a Progress Build level
- Embedded into instruction
- Assessment resource includes “Look for” and “Now what”
- Incremental build towards the Critical Juncture

Progress Build

Light and Sound

Assumed prior knowledge (preconceptions): 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.

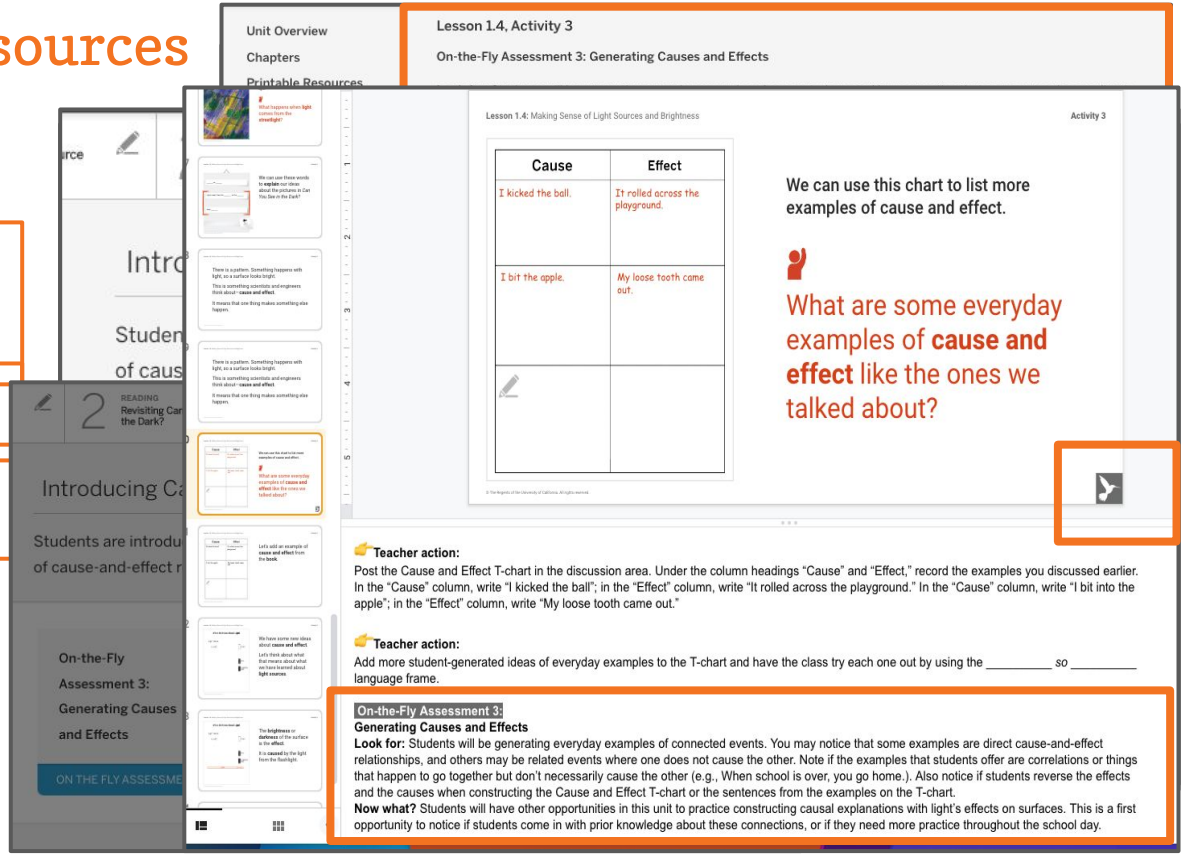


Formative assessment information

Locating assessment resources

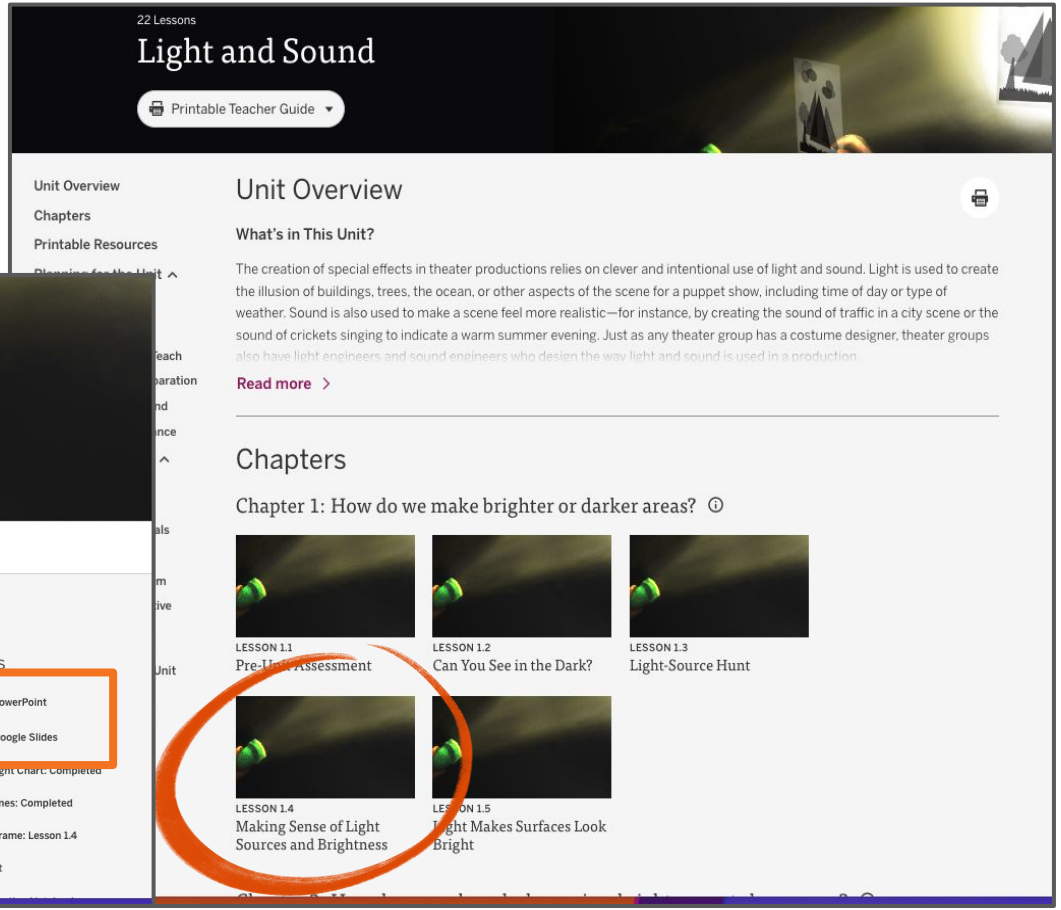
Full text of assessment

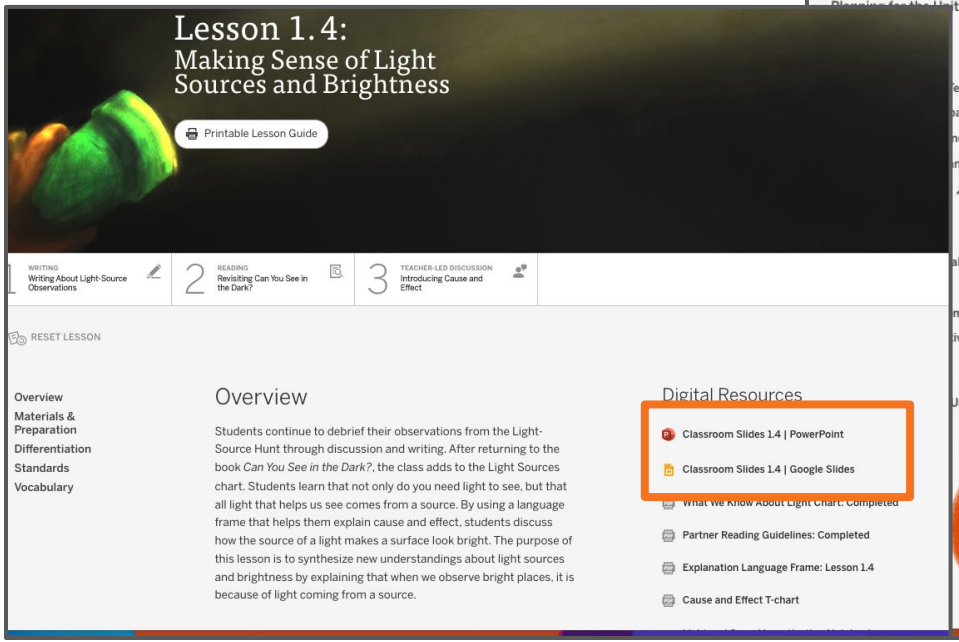
- Embedded Formative Assessments document
- Instructional guide
- Classroom Slides notes



Classroom slides

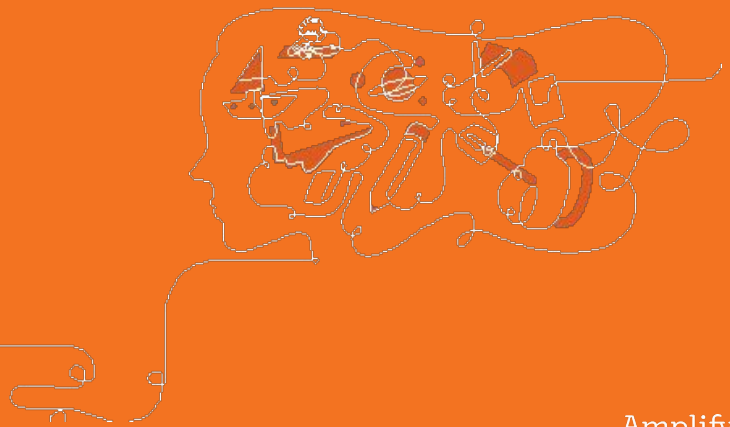
Lesson 1.4, Activity 3





Trainer Model

On-the Fly Assessment



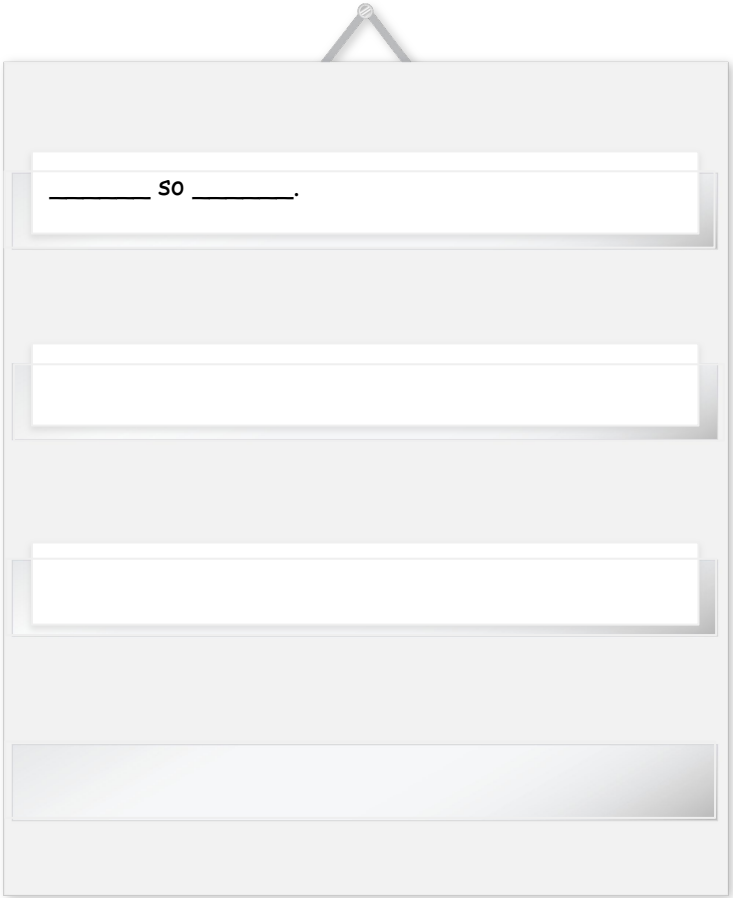
Modeling an On-the-Fly Assessment

Activity 3

Introducing Cause and Effect

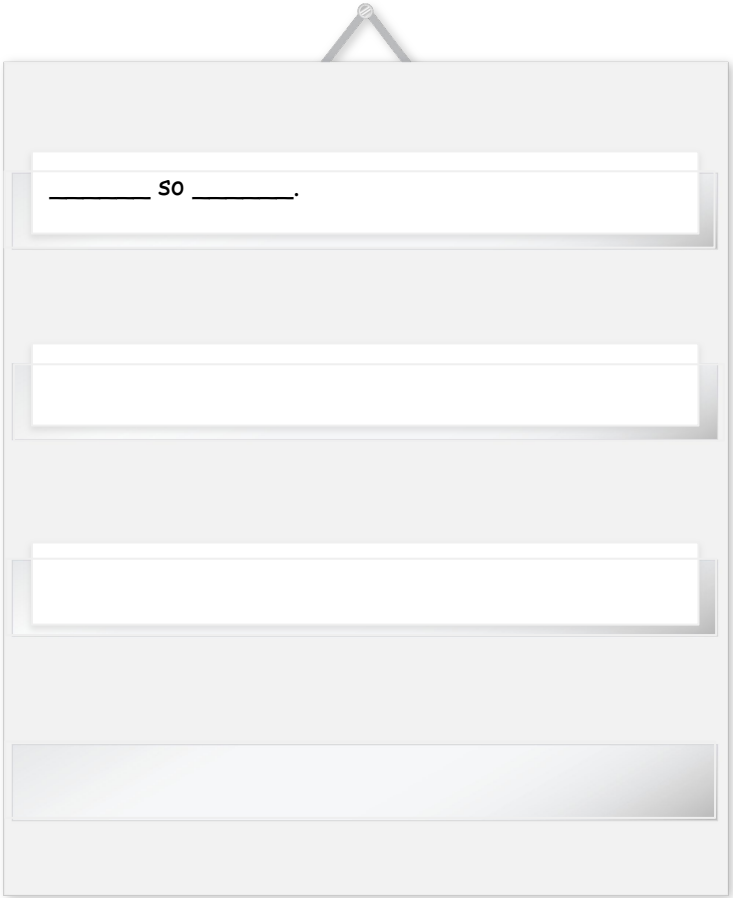
Chapter 1 Question

How do we make brighter or darker areas?



Scientists need to know **what** happened, and they also need to know **why** it happened.

The word **so** shows that two things that happened are connected.



Let’s practice using these words to talk about how everyday things are **connected**.

We can make sentences about **kicking a ball** and **biting an apple**.

Now let's connect some ideas about light.

What happens when **light** comes from the **streetlight**?

We can use these words to **explain** our ideas about the pictures in *Can You See in the Dark?*

There is a pattern. Something happens with light, so a surface looks bright.

This is something scientists and engineers think about—**cause and effect**.

It means that one thing makes something else happen.

Cause	Effect
I kicked the ball.	It rolled across the playground.
I bit the apple.	My loose tooth came out.

We can use this chart to list more examples of cause and effect.

What are some everyday examples of **cause and effect** like the ones we talked about?

_____ so _____.

Lesson 1.4: Making Sense of Light Sources and Brightness

Activity 3

Cause	Effect
I kicked the ball.	It rolled across the playground.
I bit the apple.	My loose tooth came out.

We can use this chart to list more examples of cause and effect.

What are some everyday examples of **cause and effect** like the ones we talked about?

Teacher action:
Post the Cause and Effect T-chart in the discussion area. Under the column headings "Cause" and "Effect," record the examples you discussed earlier. In the "Cause" column, write "I kicked the ball"; in the "Effect" column, write "It rolled across the playground." In the "Cause" column, write "I bit into the apple"; in the "Effect" column, write "My loose tooth came out."

Teacher action:
Add more student-generated ideas of everyday examples to the T-chart and have the class try each one out by using the _____ *so* _____ language frame.

On-the-Fly Assessment 3:
Generating Causes and Effects
Look for: Students will be generating everyday examples of connected events. You may notice that some examples are direct cause-and-effect relationships, and others may be related events where one does not cause the other. Note if the examples that students offer are correlations or things that happen to go together but don't necessarily cause the other (e.g., When school is over, you go home.). Also notice if students reverse the effects and the causes when constructing the Cause and Effect T-chart or the sentences from the examples on the T-chart.
Now what? Students will have other opportunities in this unit to practice constructing causal explanations with light's effects on surfaces. This is a first opportunity to notice if students come in with prior knowledge about these connections, or if they need more practice throughout the school day.

Lesson 1.4, Activity 3

On-the-Fly Assessment 3: Generating Causes and Effects

Look for

Look for: Students will be generating everyday examples of connected events. You may notice that some examples are direct cause-and-effect relationships, and others may be related events where one does not cause the other. Note if the examples that students offer are correlations or things that happen to go together but don't necessarily cause the other (e.g., When school is over, you go home.). Also notice if students reverse the effects and the causes when constructing the Cause and Effect T-chart or the sentences from the examples on the T-chart.

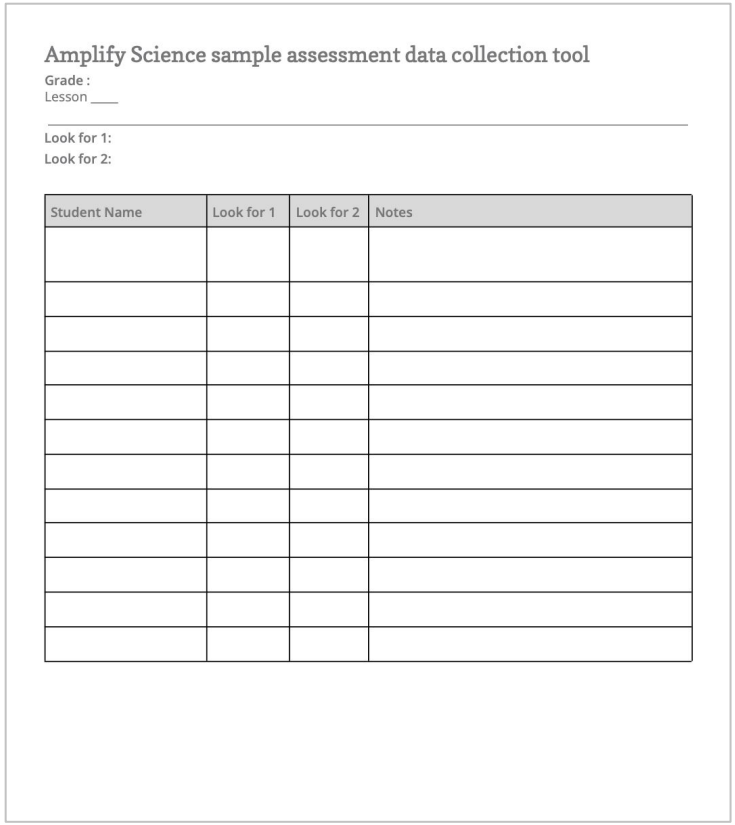
Now what? Students will have other opportunities in this unit to practice constructing causal explanations with light's effects on surfaces. This is a first opportunity to notice if students come in with prior knowledge about these connections, or if they need more practice throughout the school day.

Classroom connection

Collecting formative assessment data

Plan ahead for what you're looking and listening for.

Create a system that's easy for you to use.



Amplify Science sample assessment data collection tool

Grade :
Lesson ____

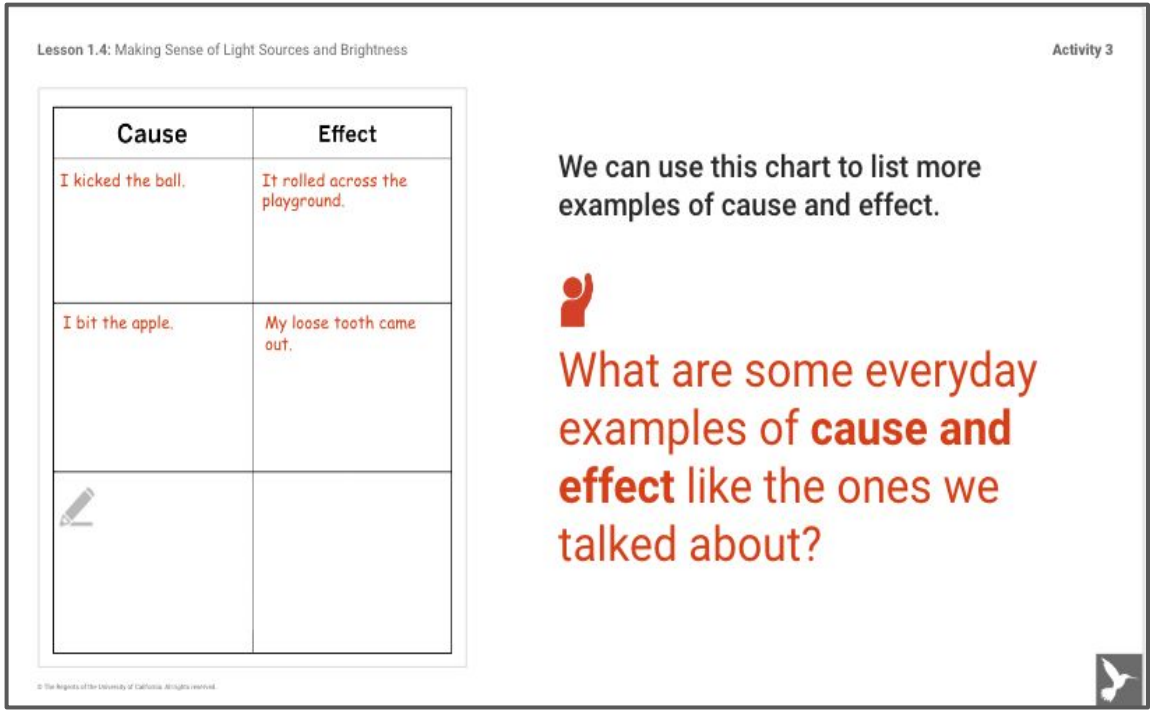
Look for 1:
Look for 2:

Student Name	Look for 1	Look for 2	Notes

Example assessment (On-the-Fly, Lesson 1.4, Activity 3)

Reflection

- What **data** can a teacher collect from this activity?
- What can a teacher **do** with this information?

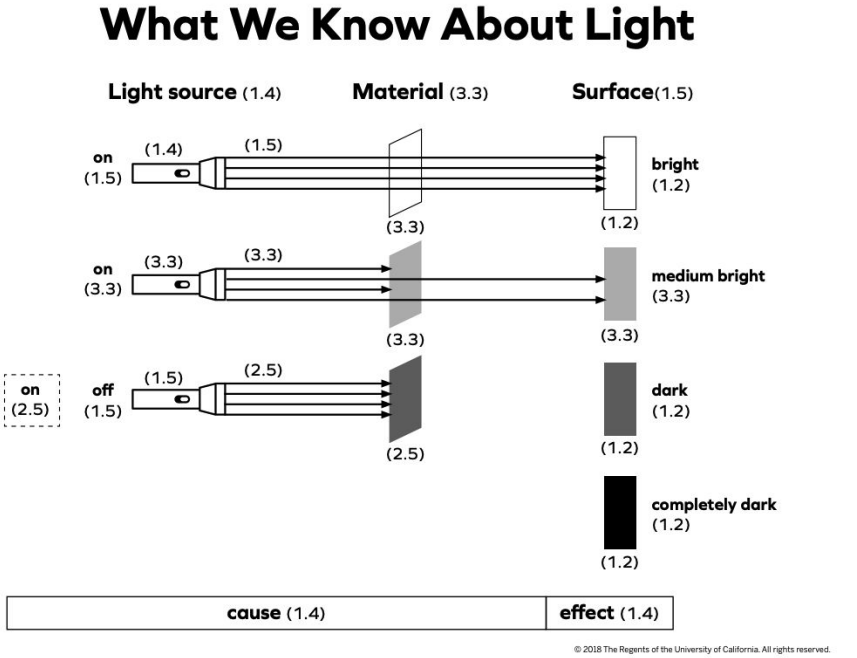


Additional formative assessment information

On-the-Fly Assessments

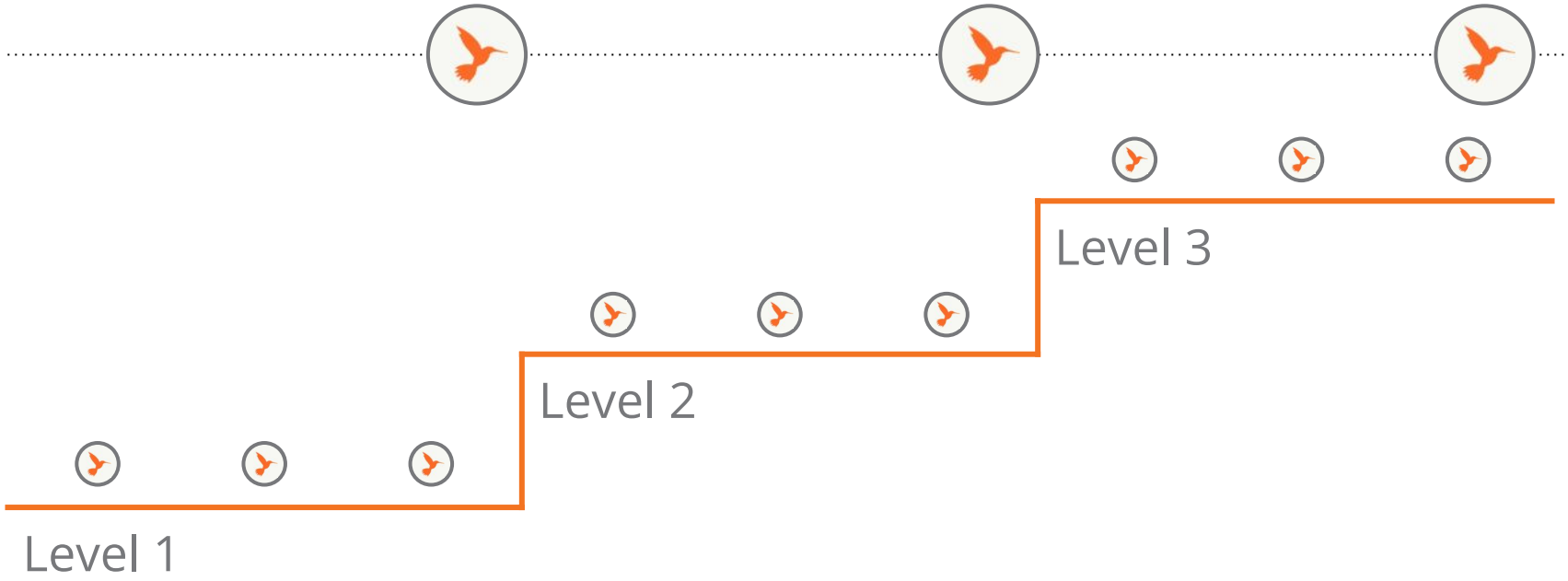
In addition to assessing concepts in the Progress Build, some On-the-Fly Assessments provide data about:

- Science and Engineering Practices
- Crosscutting Concepts
- Literacy skills
- Student collaboration



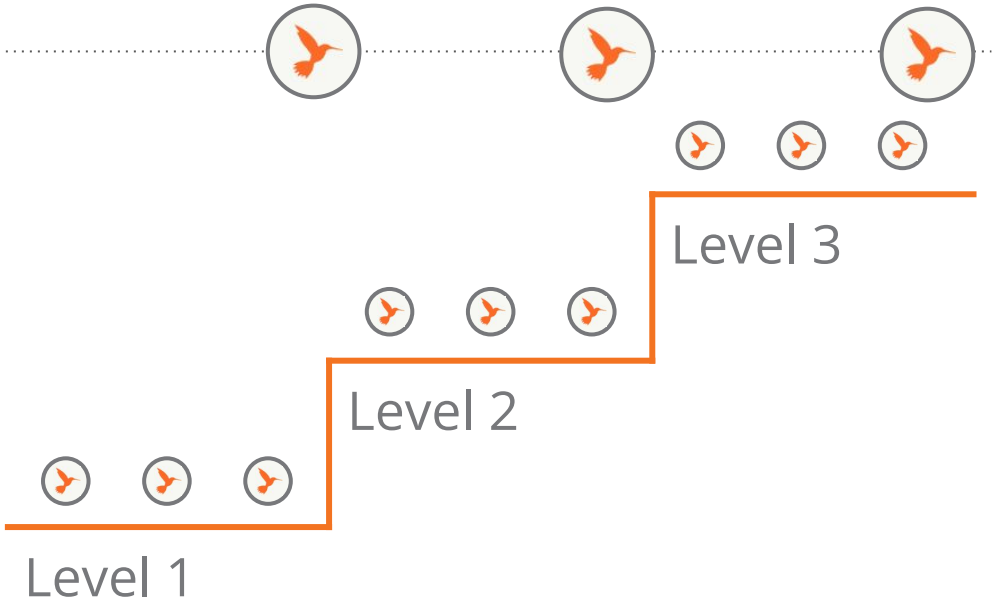
Questions?

Critical Juncture Assessments

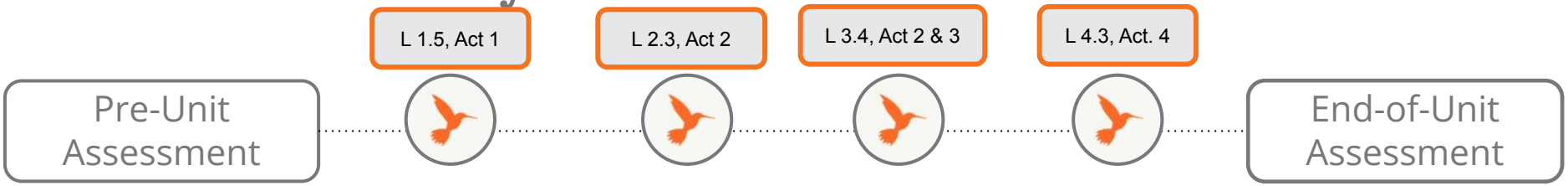


Critical Juncture Assessments

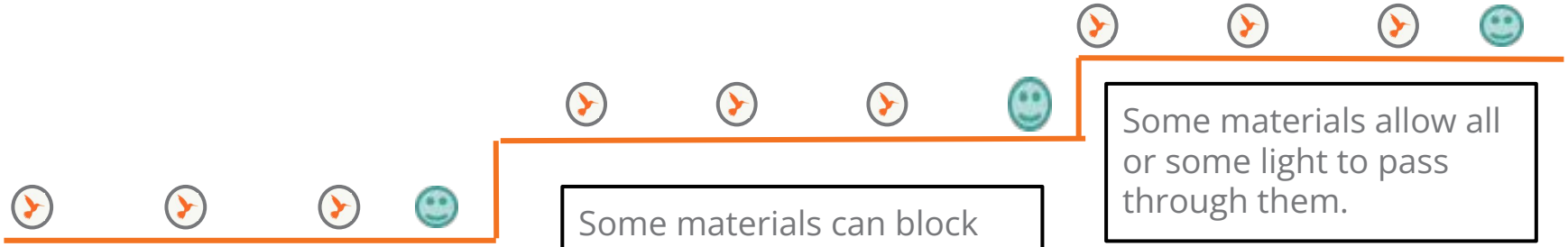
- Track student progress between Progress Build levels
- Embedded into instruction
- Assessment resource includes “Assess Understanding” and “Tailor Instruction”



K-5 Assessment System



Critical Juncture Assessments



Light from a source makes surfaces visible and look brighter.

Some materials can block light from reaching a surface.

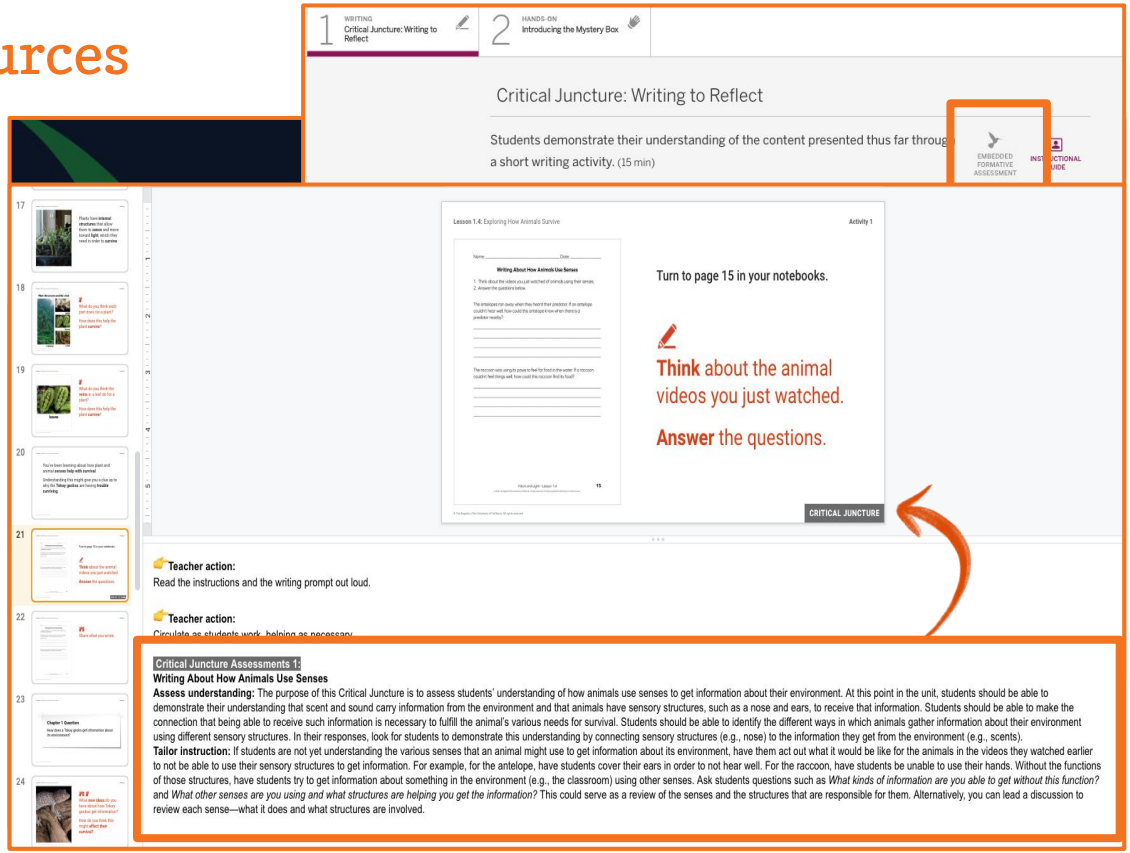
Some materials allow all or some light to pass through them.

Formative assessment information

Locating assessment resources

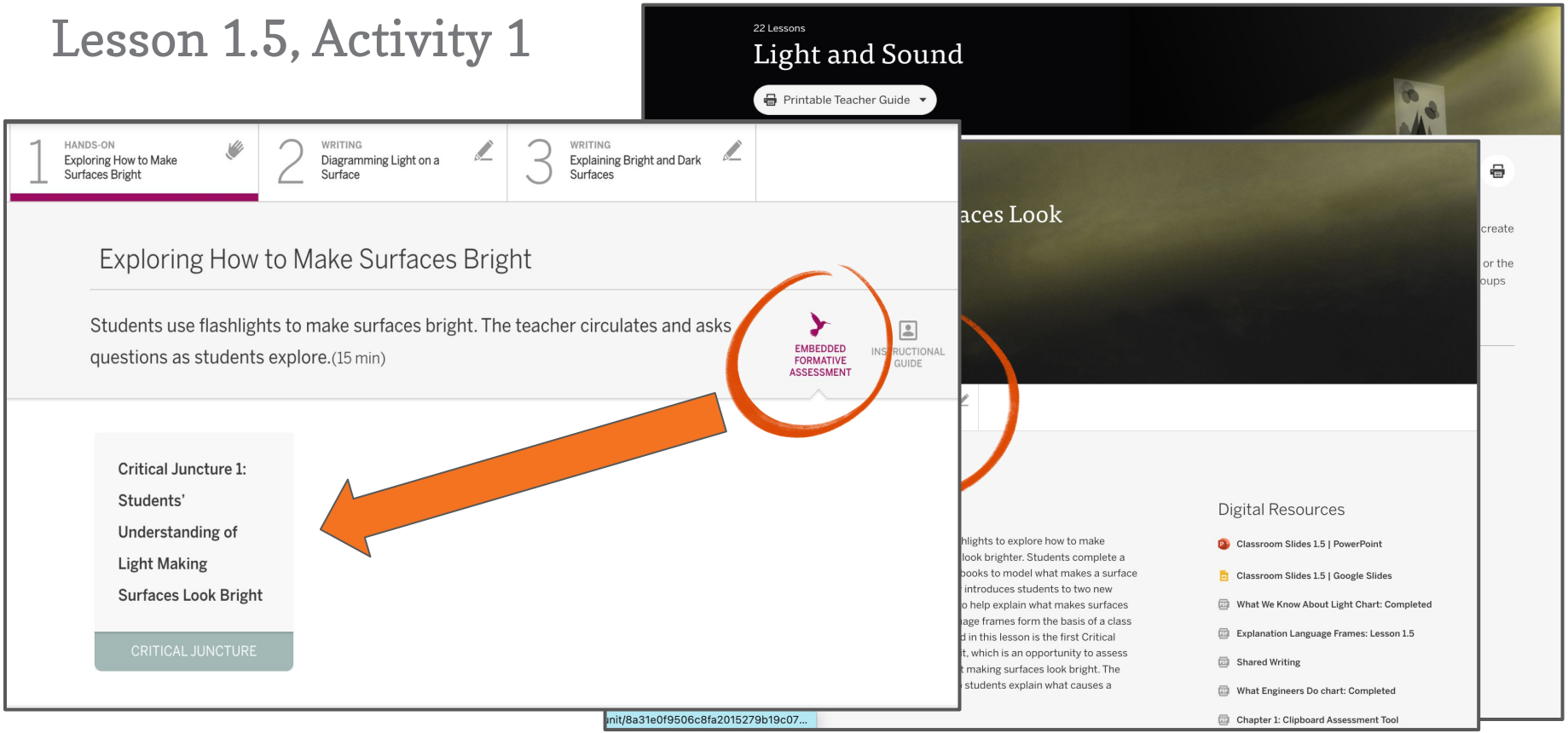
Full text of assessment

- Embedded Formative Assessments document
- Instructional guide
- Classroom Slides notes



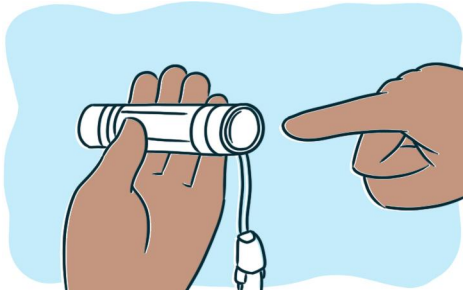
Critical Juncture Assessment

Lesson 1.5, Activity 1



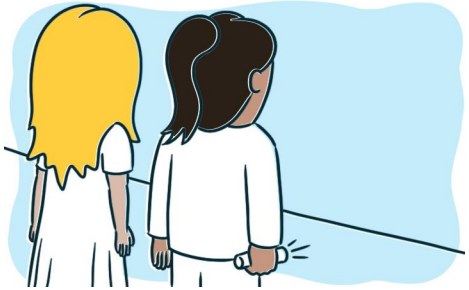
We're Going to Model This In Particular After Lunch

Making Surfaces Bright



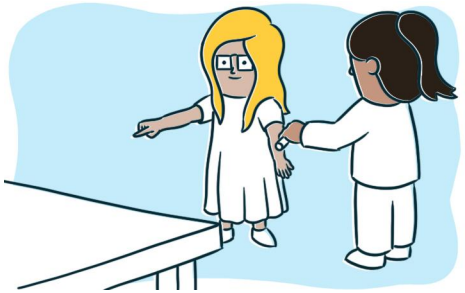
1.

Turn the flashlight on. Press the button.



2.

Choose **one surface** at a time, and **make it bright.**



3.

Take turns. Pick a different surface each time.

Embedded Formative Assessment

Lesson 1.5, Activity 1

Critical Juncture 1: Students' Understanding of Light Making Surfaces Look Bright

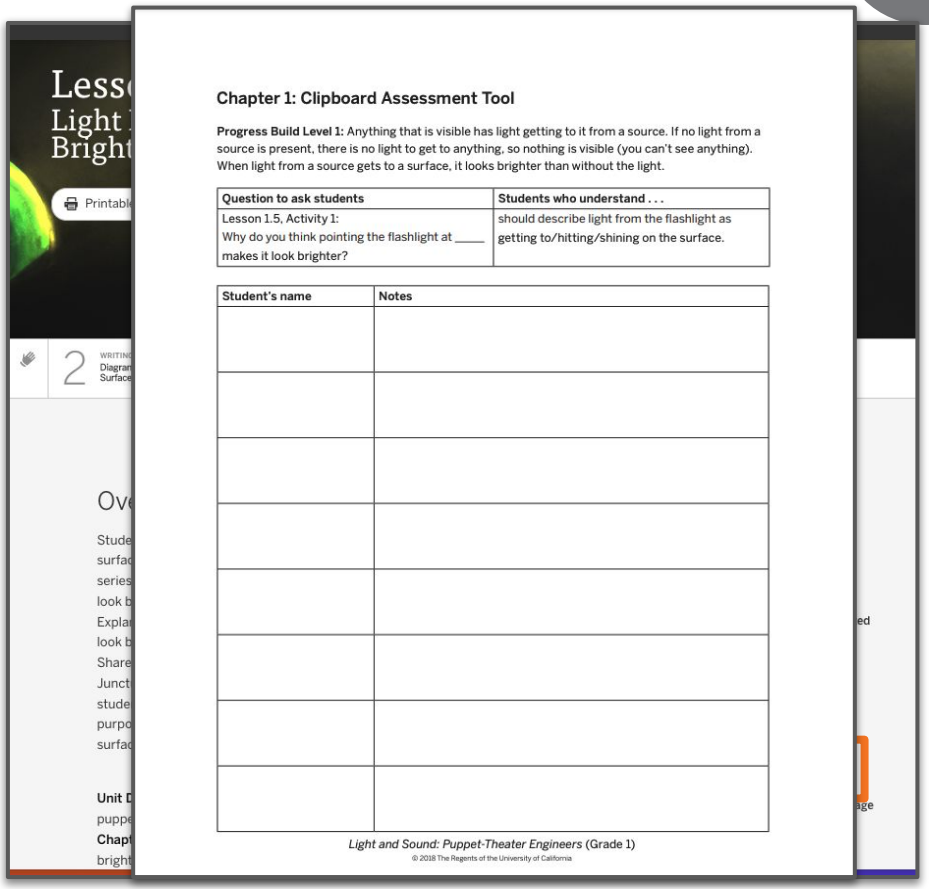
Assess understanding: Question students as they explore in order to assess their understanding of light from a source getting to a surface and making it look brighter. The question included with the Chapter 1: Clipboard Assessment Tool (*Why do you think pointing the flashlight at ____ makes it look brighter?*) is available as a reference. There is also a space to record notes about several students' responses. In general, students who understand these ideas should say that light gets to, hits, or shines on the surface to make it brighter. It is important to keep in mind that students have an additional opportunity to learn this content as you model the light diagram and the written explanation with them.

Tailor instruction: If many of your students are not showing evidence of understanding that light from a source gets to a surface and makes it look brighter, and you are not confident that the modeling has addressed those gaps in their understanding, we recommend offering additional instruction in Lesson 2.1. In Activity 2 of Lesson 2.1, you can take time for a more focused review and instruction showing light getting to the wall. (See the Augmenting Instruction: Differentiating in Response to Critical Juncture Assessment note in the Teacher Support tab in that activity for details.) If a smaller number of your students are not showing evidence of understanding those ideas, you can lead a similar discussion with just those students, before or during Lesson 2.1.

K-1 Clipboard Assessment Tool

Pgs. 14-15

The Clipboard Assessment Tool offers a support for collecting data for the On-the-Fly and Critical Juncture Assessments that align to each Progress Build level in the unit.



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: 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.

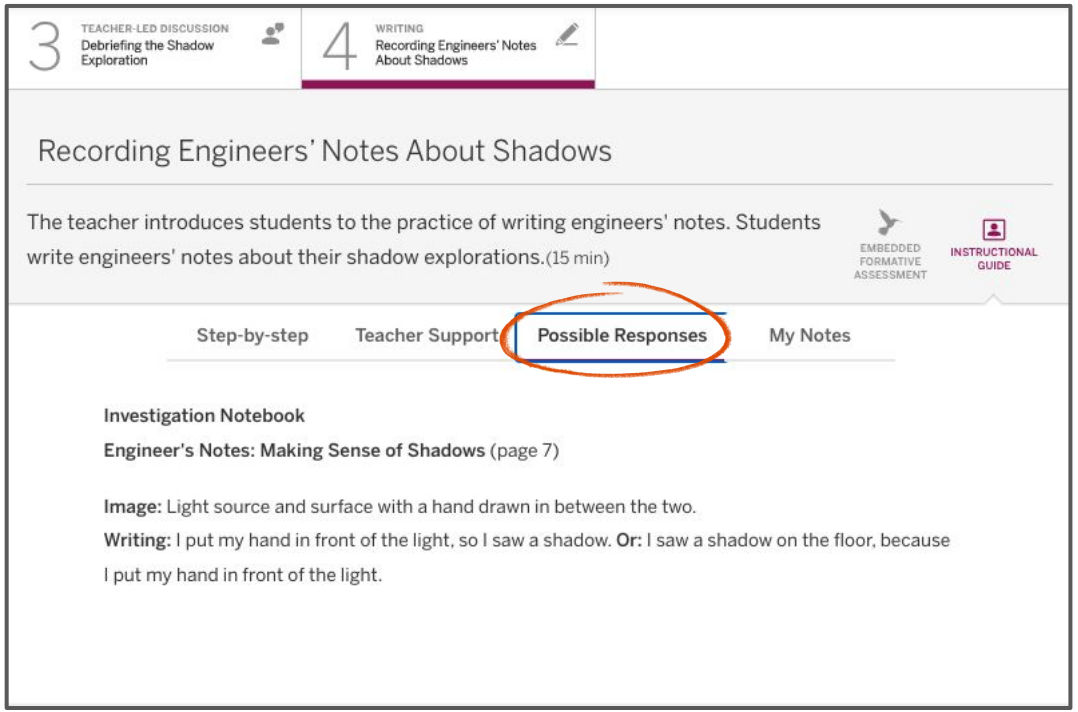
Student's name	Notes

Light and Sound: Puppet-Theater Engineers (Grade 1)

Formative assessment information

Possible student responses

- Within assessments:
  - “Look fors” (OtF)
  - “Assess Understanding” (CJ)
- Possible responses within the Instructional Guide
- Digital resources
  - Assessment Guides
  - Teacher References

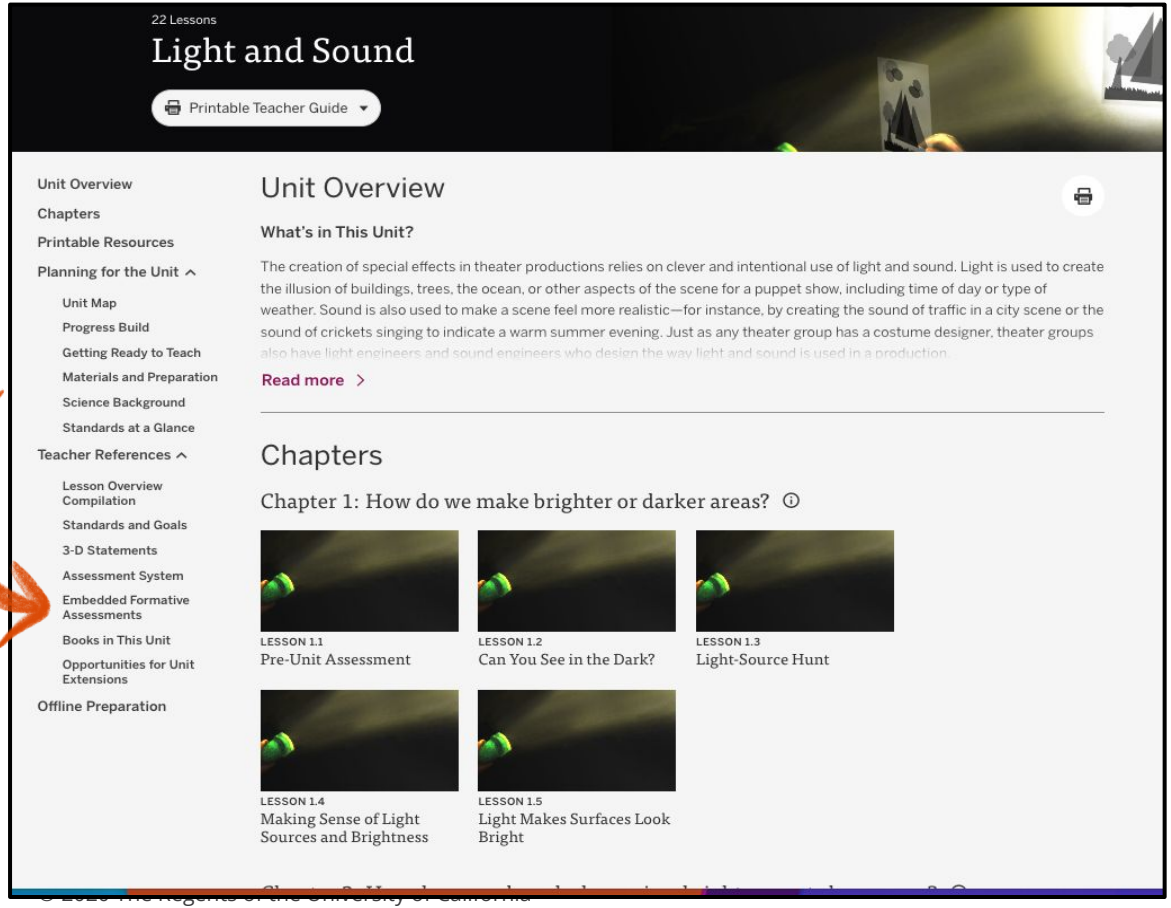


Formative Assessments

Work Time

Take a moment to explore Embedded Formative Assessments

What do the On-the-Fly and Critical Juncture Assessments look like for Chapters 2, 3, and 4?



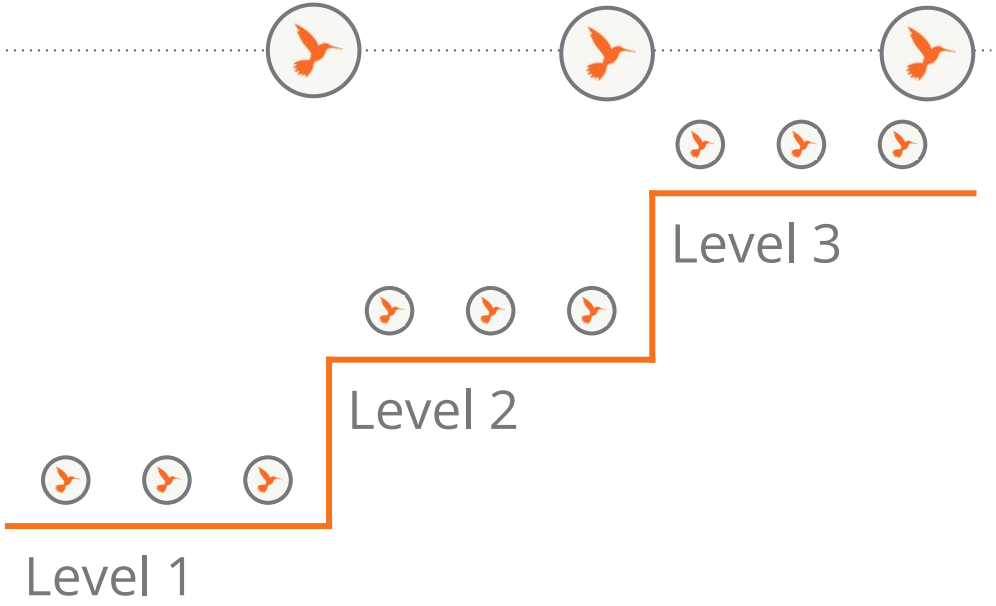
Embedded formative assessments

Reflection

With a partner, describe the relationship among:

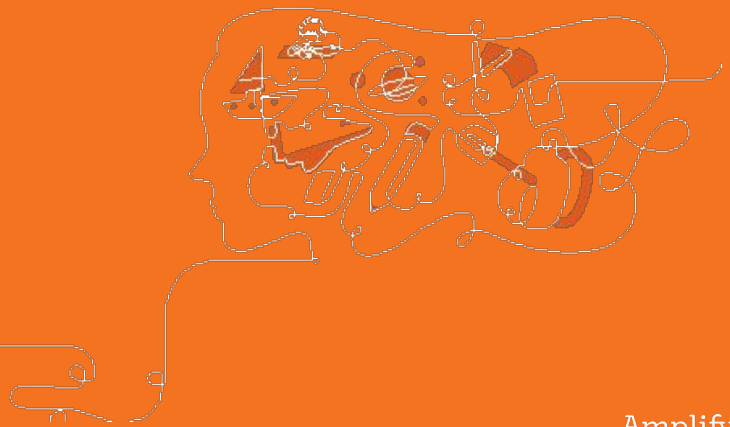
- Progress Build
- On-the-Fly Assessments
- Critical Juncture Assessments

Check-in about how each of you feels about the assessments and also how ready you're able to use each

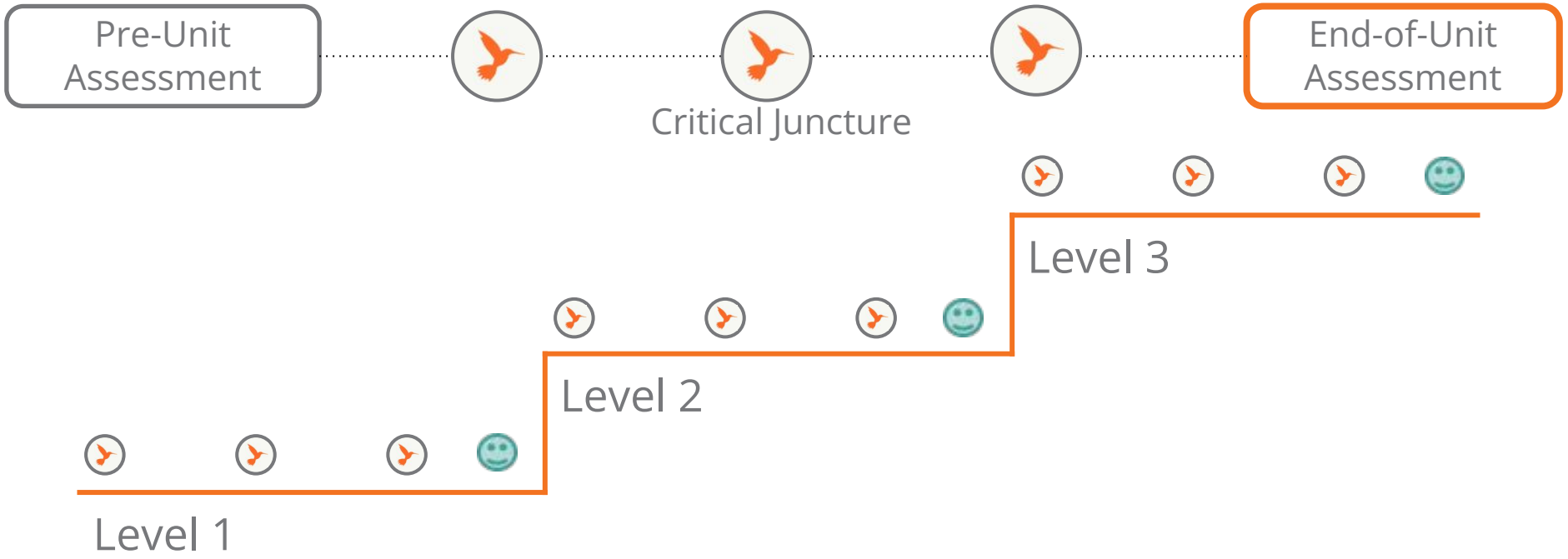


Questions?

End-of-Unit Assessment



K-5 Assessment System



End-of-Unit Assessment

3-dimensional assessment opportunity

- Summative assessment of mastery of Disciplinary Core Ideas
- Also an Assessment of Science and Engineering Practices, and Crosscutting Concepts

3 Dimensional Learning

Assessment Guide

Science and Engineering Practice

- Practice 6: Constructing Explanations and Designing Solutions
  - CEDS-P1: Use information from observations (firsthand and from media) to construct an evidence-based account for natural phenomena.

Disciplinary Core Ideas

- PS4.B: Electromagnetic Radiation:
  - PS4.B-P1: Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2)
- PS4.B: Electromagnetic Radiation:
  - PS4.B-P2: Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach... (1-PS4-3)

Crosscutting Concept

- Cause and Effect
  - CE-P1: Simple tests can be designed to gather evidence to support or refute student ideas about causes.

From Assessment Guide: Assessing Students' End-of-Unit Explanations About a Scene with Light Sources and Bright and Dark Areas

Lesson Review Prior to the End of Unit Assessment

Lesson 4.5

- Teacher models how to complete the mini-book
- Students finish their mini books and read it to their partners
- Partners share and explain their solutions-how their stencils and sound sources work together
- Partners share and explain their solutions-how their stencils and sound sources work together
- Teachers shares artifacts from each chapter and partners discussed what they learned.

End of Unit Assessments

What are students being asked to do?

Explain how each part of your stencil work.

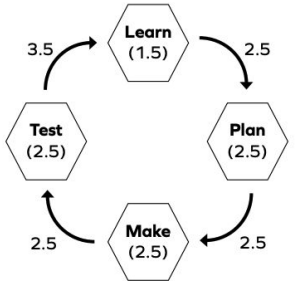
Why do these different areas of the wall look dark, bright, and medium bright?

- Why does this area of the surface look bright?
- Why does this area of the surface look dark?
- Why does this area of the surface look medium bright?

What Engineers Do (1.2)

Find out about a problem. (1.2)

Design a solution (2.5)



hare to communicate and explain
our ideas. (1.5)

End of Unit Assessment Rubric

From Assessment Guide: Assessing Students' End-of-Unit Explanations About a Scene with Light Sources and Bright and Dark Areas

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)? • Did the student explain the brighter and darker areas as a result of more light or less light getting to the surface? • Did the student describe the opaque material as letting no light pass through (or as blocking all light)? • Did the student explain that the dark area is dark because no light gets to the surface? • Did the student describe the transparent material as letting all light pass through (or as blocking no light)? • Did the student explain that the bright area is bright because all light gets to the surface? • Did the student describe the tinted material as letting some light pass through (or as blocking some light)? • 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 an

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

| Rubric 2: Assessing Students' Understanding of the Crosscutting Concept
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?
• 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?)
• 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)? • Did the student accurately state whether the solution met all the design goals? • Did the student evaluate each design goal individually? (e.g., *It's supposed to make a dark area, and it does that.*) • 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)

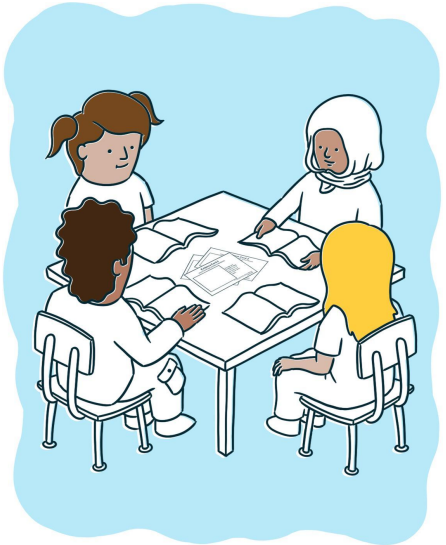
End-of-Unit Assessment

Work Time

With the Assessment Guide for for Unit (End of Last Chapter),

1. Read through the rubrics, questions, and slide deck notes (teacher action).
2. Add any additional questions to the slides that will elicit the explanations needed.
3. Determine what will you have the other students doing while you are individually assessing students.

We're going to share out findings and best practices in about 10-15 mins.



Progress Build

Light and Sound

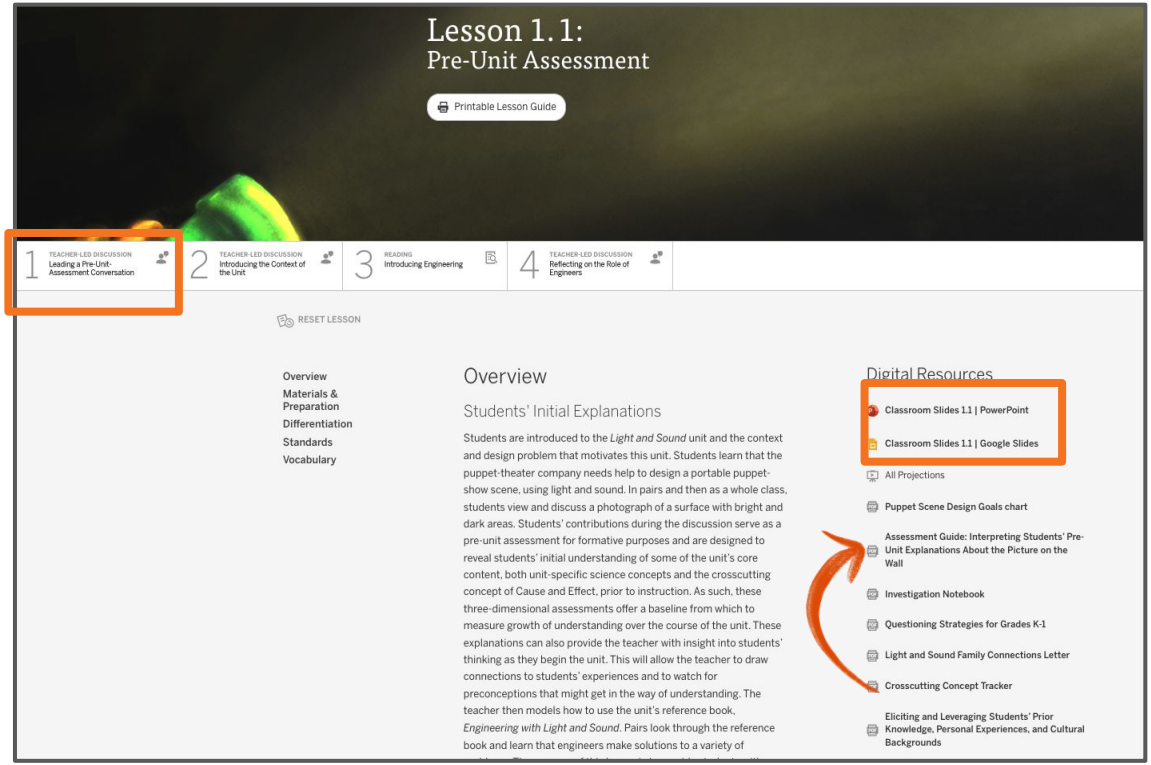
Assumed prior knowledge (preconceptions): Students have likely had some direct or indirect experience with turning on and off overhead lights, lamps, or flashlights. They may also have some experience observing or creating shadows.

Pre-Unit Assessment

Lesson 1.1

Locate the Pre-Unit Assessment Guide in Lesson 1.1 of your unit and skim through them.

Open up the classroom slides and see how the pre-unit assessment is embedded in the lesson. Also, look at Activity 1 and read how it is explained.



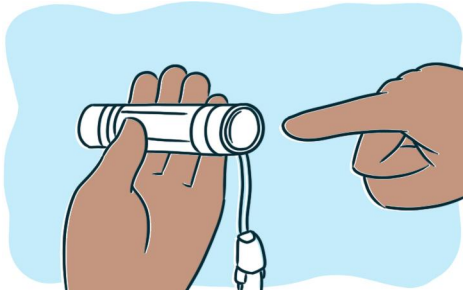
On-the-Fly Assessments

- Track student progress within a Progress Build level
- Embedded into instruction
- Assessment resource includes “Look for” and “Now what”
- Incremental build towards the Critical Juncture

We're Going to Model This In Particular After Lunch

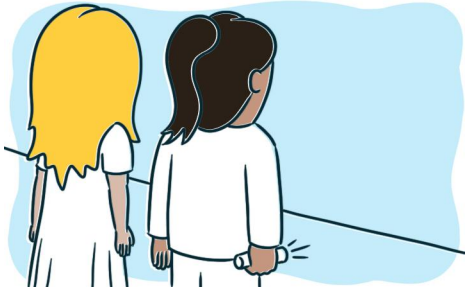
Critical Juncture Assessments

Making Surfaces Bright



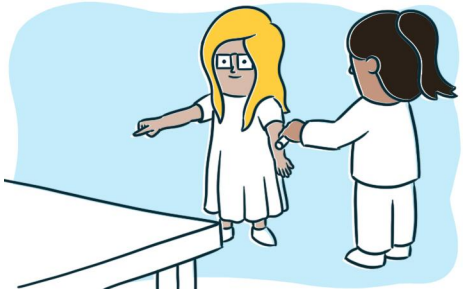
1.

Turn the flashlight on. Press the button.



2.

Choose **one surface** at a time, and **make it bright.**



3.

Take turns. Pick a different surface each time.

End of Unit Assessments

What are students being asked to do?

Explain how each part of your stencil work.

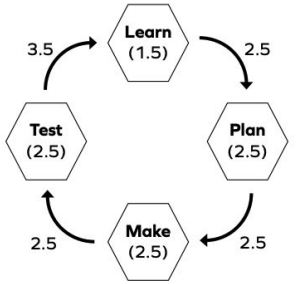
Why do these different areas of the wall look dark, bright, and medium bright?

- Why does this area of the surface look bright?
- Why does this area of the surface look dark?
- Why does this area of the surface look medium bright?

What Engineers Do (1.2)

Find out about a problem. (1.2)

Design a solution (2.5)



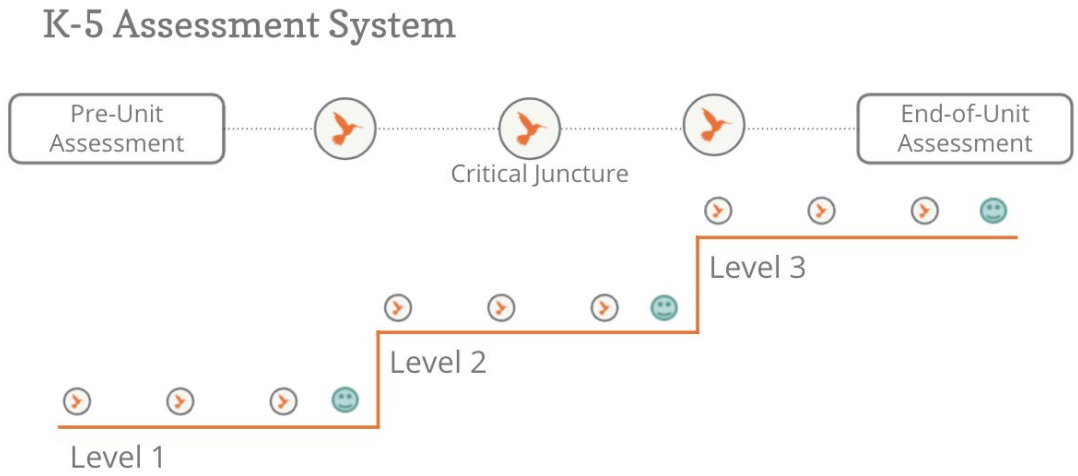
hare to communicate and explain
our ideas. (1.5)

Assessment System

Reflection

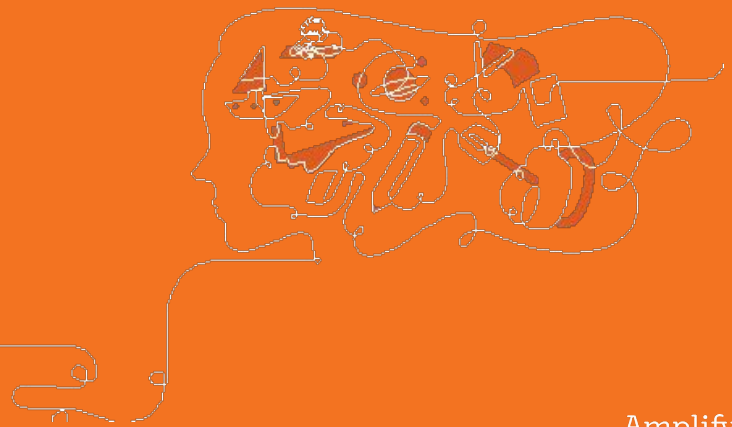
With a NEW partner,

- How do the Progress Build and Assessments work as a **System**?
- What are the benefits of this system for students? For teachers?
- How might **YOU** see yourself using these tools? Which resonate with you or interest you most?



Questions?

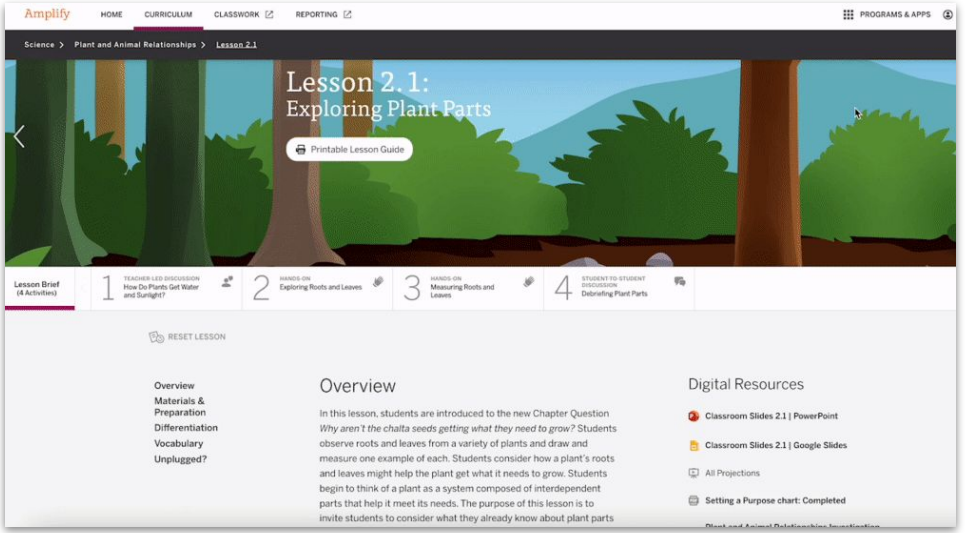
Lunch Break



Resources for NGSS progress monitoring

NGSS Benchmark assessments

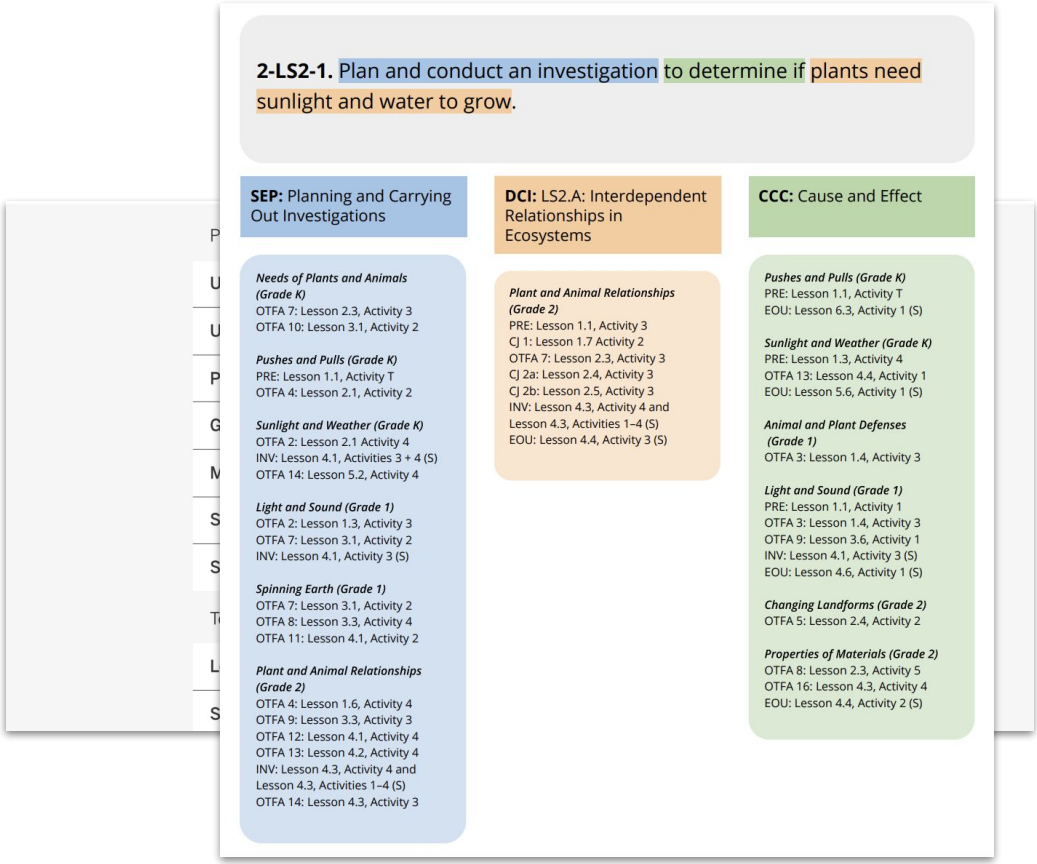
- Accessible in the Global Navigation menu
- Grades 3-5
- 4 assessments per grade



Resources for NGSS progress monitoring

3D Assessment Objectives

- Located in the Unit Guide
- Identifies where each dimension of the target Performance Expectations are assessed in the unit, in the grade, or in the grade-band.



2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.

SEP: Planning and Carrying Out Investigations

Needs of Plants and Animals (Grade K)
OTFA 7: Lesson 2.3, Activity 3
OTFA 10: Lesson 3.1, Activity 2

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
OTFA 4: Lesson 2.1, Activity 2

Sunlight and Weather (Grade K)
OTFA 2: Lesson 2.1 Activity 4
INV: Lesson 4.1, Activities 3 + 4 (S)
OTFA 14: Lesson 5.2, Activity 4

Light and Sound (Grade 1)
OTFA 2: Lesson 1.3, Activity 3
OTFA 7: Lesson 3.1, Activity 2
INV: Lesson 4.1, Activity 3 (S)

Spinning Earth (Grade 1)
OTFA 7: Lesson 3.1, Activity 2
OTFA 8: Lesson 3.3, Activity 4
OTFA 11: Lesson 4.1, Activity 2

Plant and Animal Relationships (Grade 2)
OTFA 4: Lesson 1.6, Activity 4
OTFA 9: Lesson 3.3, Activity 3
OTFA 12: Lesson 4.1, Activity 4
OTFA 13: Lesson 4.2, Activity 4
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
OTFA 14: Lesson 4.3, Activity 3

DCI: LS2.A: Interdependent Relationships in Ecosystems

Plant and Animal Relationships (Grade 2)
PRE: Lesson 1.1, Activity 3
CJ 1: Lesson 1.7 Activity 2
OTFA 7: Lesson 2.3, Activity 3
CJ 2a: Lesson 2.4, Activity 3
CJ 2b: Lesson 2.5, Activity 3
INV: Lesson 4.3, Activity 4 and Lesson 4.3, Activities 1–4 (S)
EOU: Lesson 4.4, Activity 3 (S)

CCC: Cause and Effect

Pushes and Pulls (Grade K)
PRE: Lesson 1.1, Activity T
EOU: Lesson 6.3, Activity 1 (S)

Sunlight and Weather (Grade K)
PRE: Lesson 1.3, Activity 4
OTFA 13: Lesson 4.4, Activity 1
EOU: Lesson 5.6, Activity 1 (S)

Animal and Plant Defenses (Grade 1)
OTFA 3: Lesson 1.4, Activity 3

Light and Sound (Grade 1)
PRE: Lesson 1.1, Activity 1
OTFA 3: Lesson 1.4, Activity 3
OTFA 9: Lesson 3.6, Activity 1
INV: Lesson 4.1, Activity 3 (S)
EOU: Lesson 4.6, Activity 1 (S)

Changing Landforms (Grade 2)
OTFA 5: Lesson 2.4, Activity 2

Properties of Materials (Grade 2)
OTFA 8: Lesson 2.3, Activity 5
OTFA 16: Lesson 4.3, Activity 4
EOU: Lesson 4.4, Activity 2 (S)

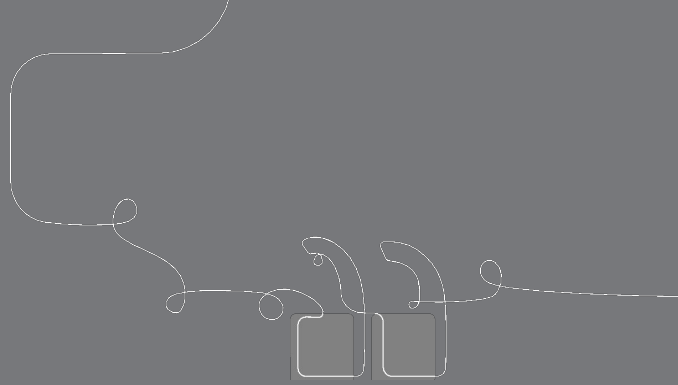
Generating grades

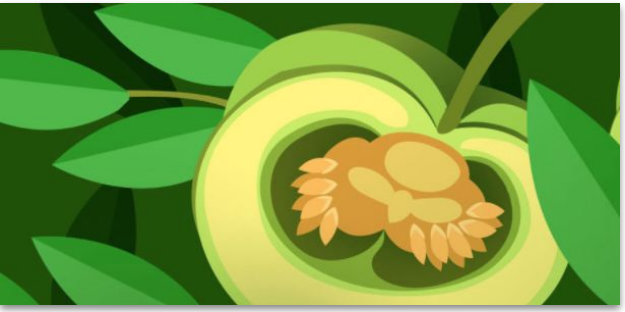
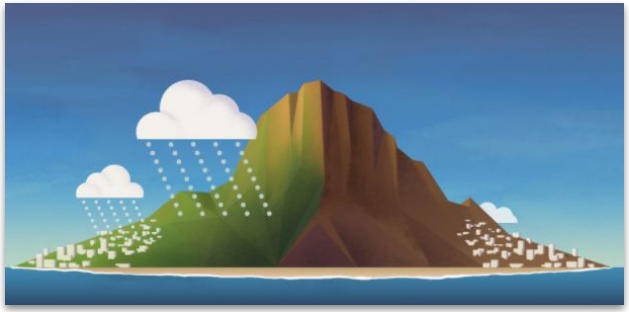
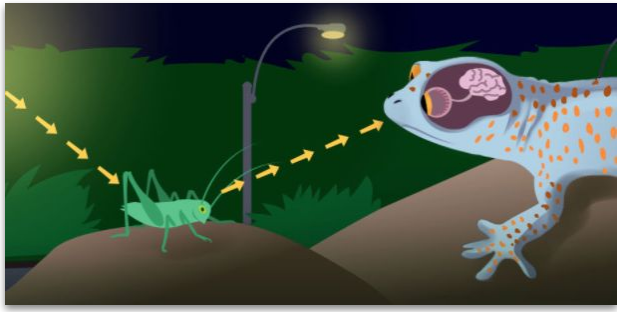
Group collaborative discussion

What are your district's grading requirements for science?

How will you use Amplify Science assessments to generate grades?

Questions?



Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson (Overview of Lessons 1.1 - 1.4, and Model of Lesson 1.5)
- Planning Your Next Unit
- Closing

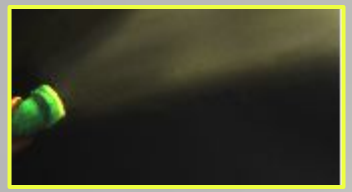
Light and Sound

Problem: **How can students use light and sound to design shadow scenery and sound effects for a puppet theater?**

Role: Light and Sound Engineer

In this unit, students will take on the role of light engineers as they are challenged with a design problem to design, build, and then project a scene for a puppet show.

Coherent Storylines



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

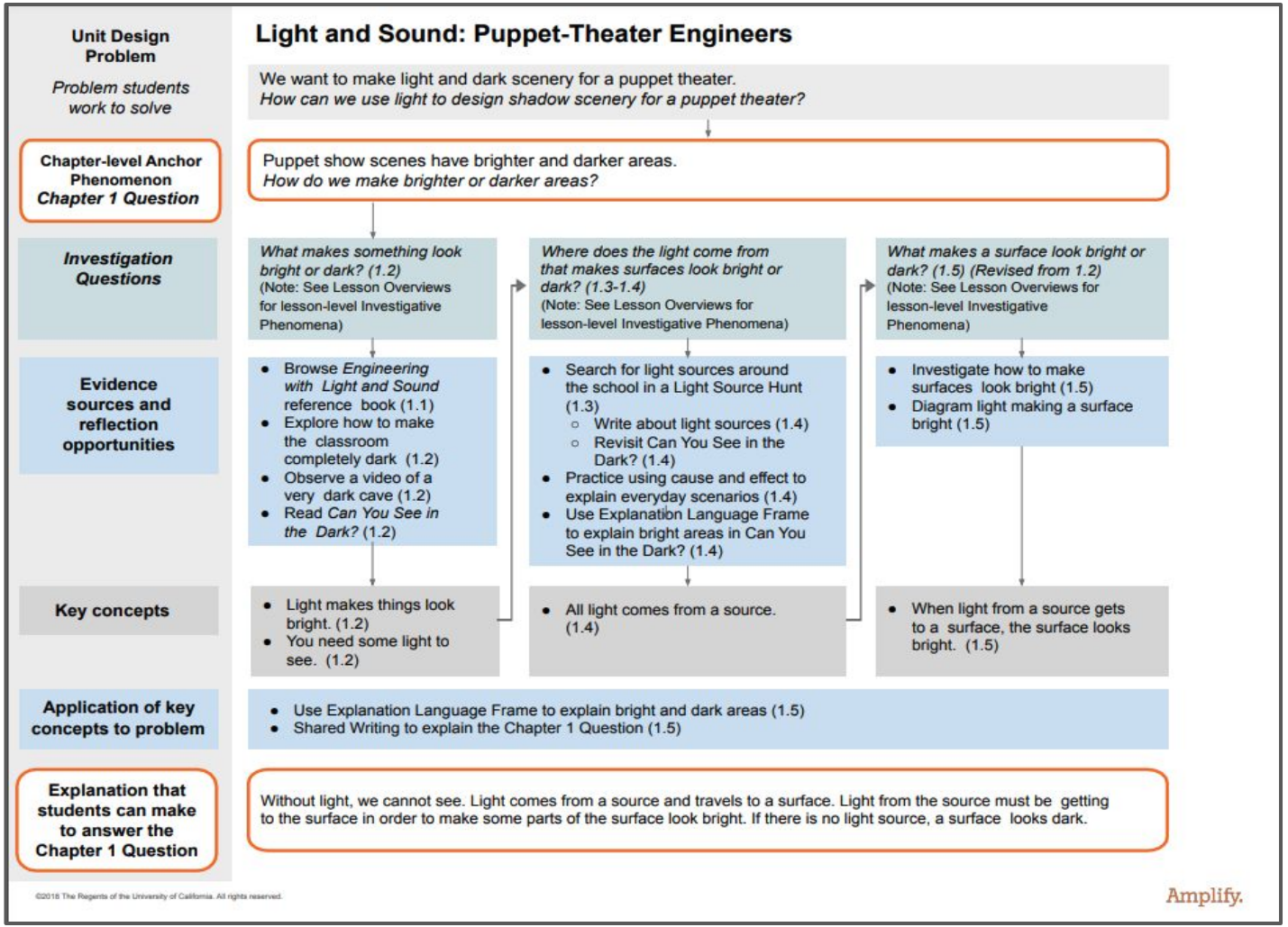
How do we make a dark area in a bright puppet show scene?

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

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

Coherence Flowchart

Chapter 1



Light and Sound

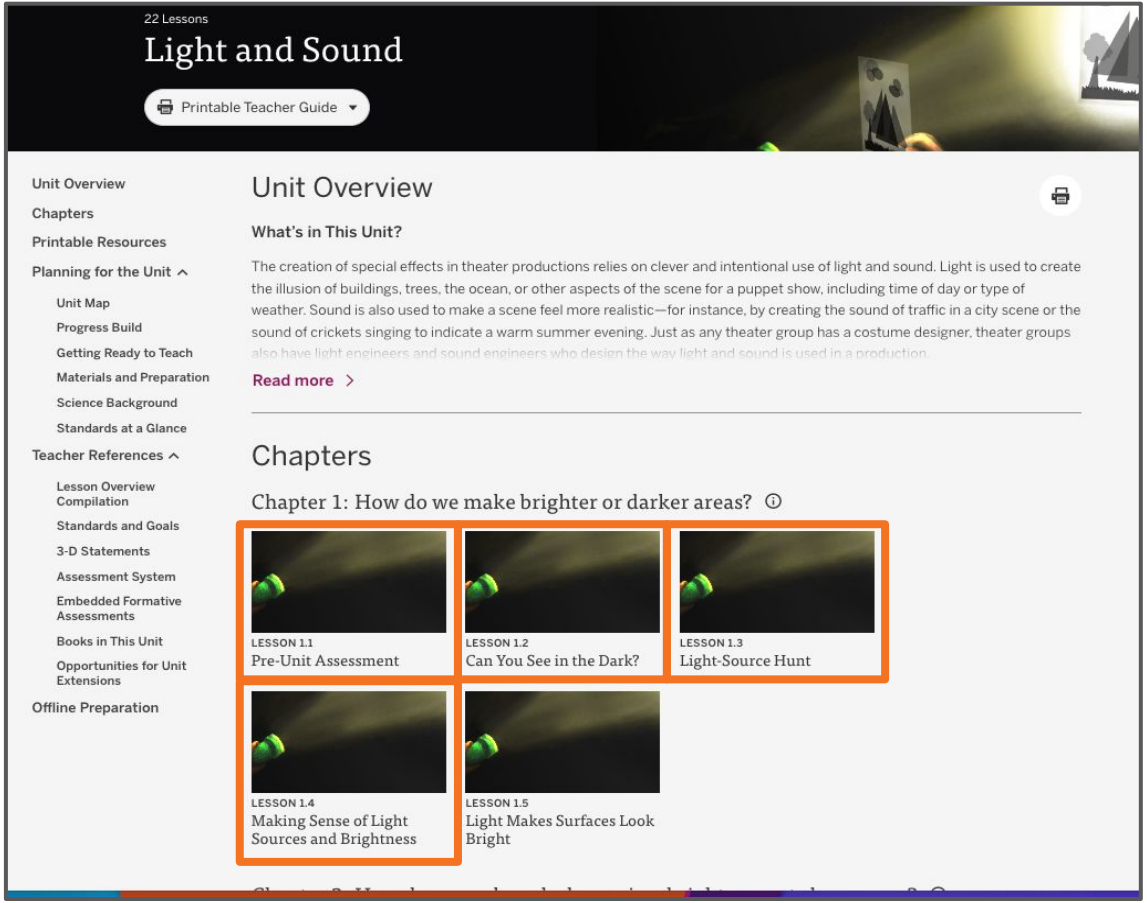
Leading up to our model lesson

L 1.1-Pre-Unit Assessment and Introduction to Phenomenon, Browse *Engineering with LIght and Sound*

L 1.2-Explore how to make the classroom completely dark, observe a video of a very dark cave, and Read *Can You See in the Dark?*

L 1.3 Search for light sources around the school in a Light Source Hunt.

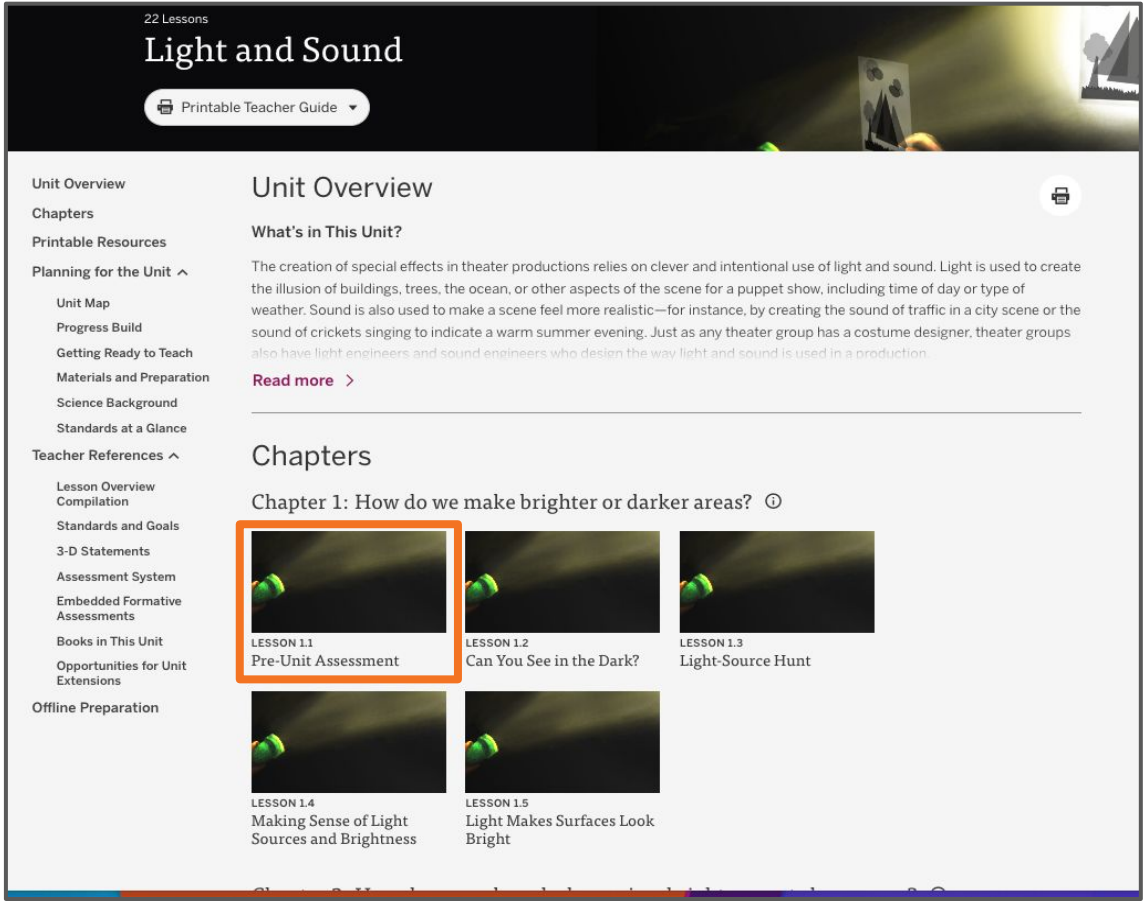
L 1.4-Write about light sources, revisit *Can You See in the Dark?*, Practice using cause and effect to explain everyday scenarios, and use Explanation Language Frame to explain bright areas in *Can You See in the Dark?*



Light and Sound

Lesson 1.1

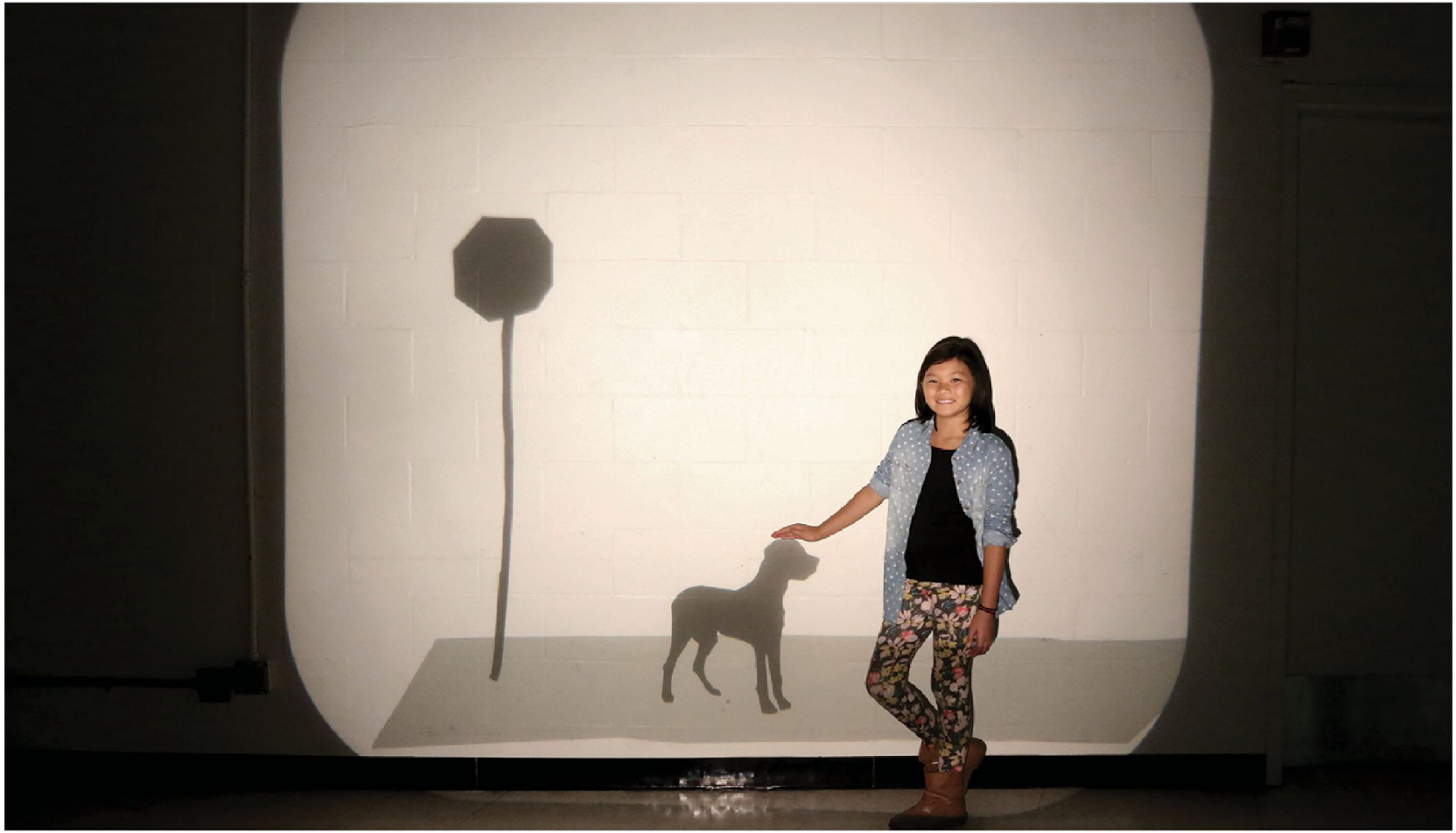
- Leading a pre-unit assessment conversation
- Introducing the puppet theater's problem and their role as engineers



We will start learning about **light and sound**.

We will be **engineers** who work with light and sound. Today we will learn what light and sound engineers do.

Let’s get ready by **observing** some pictures and describing what we notice.



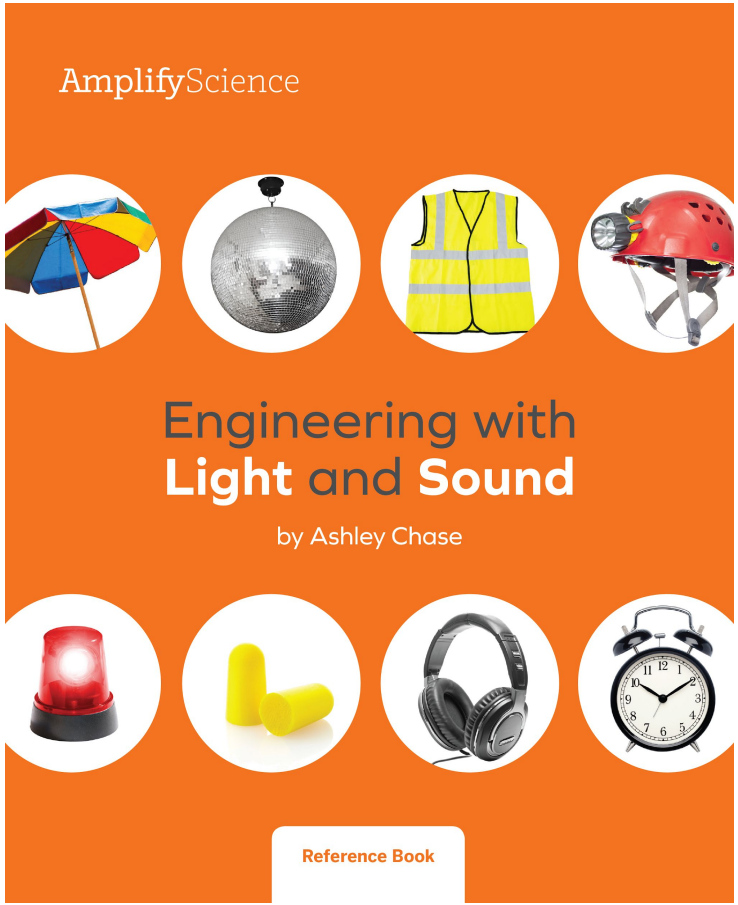
A **puppet-theater company** has come to us with a **problem** that they think we can **solve** by using **light and sound**.

Their puppet shows use many heavy parts that are difficult to carry around. They are hoping that we can figure out how to **use light to make a picture on a wall** instead.

Let’s look at a picture of their puppet shows and talk about what we notice.

Puppet Show: Scene 1

Puppet Show: Scene 2



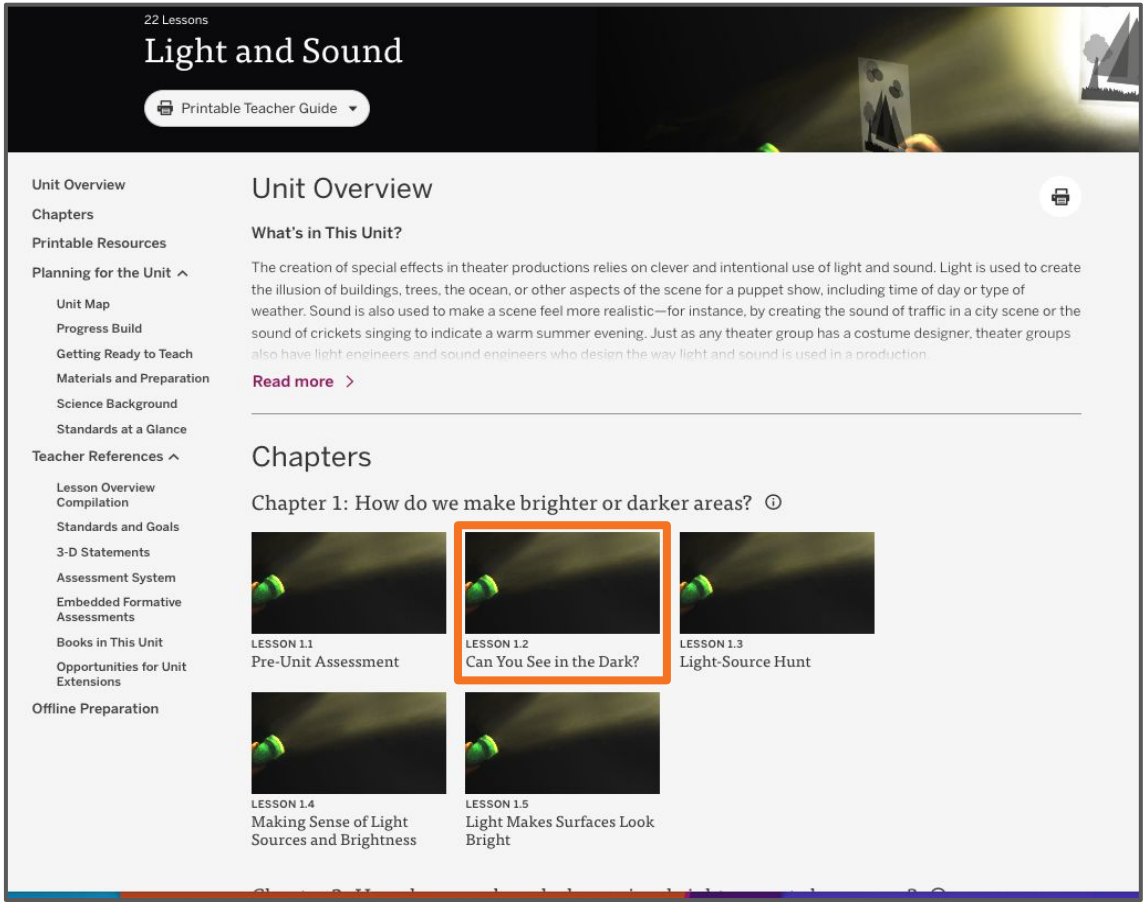
We will read this book about engineering to find out more about **what engineers do**.

This is a special type of book called a **reference book**.

Light and Sound

Lesson 1.2

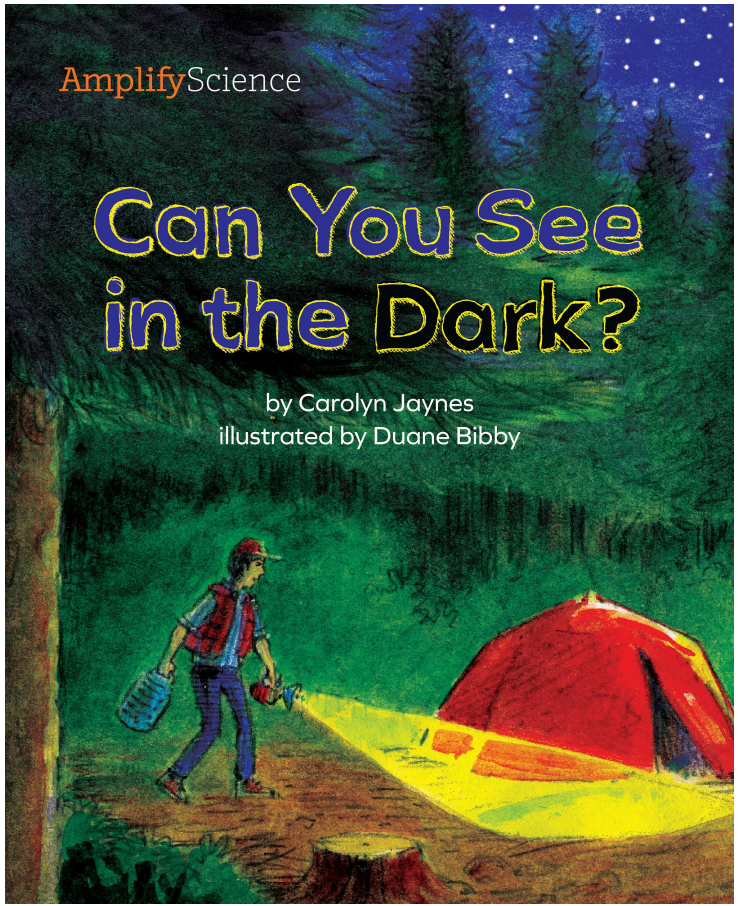
- Observing a Dark Place
- Reading *Can You See in the Dark?* **(Assessment, Questions about the Book)**



Try to Make It Very Dark

1.
Cup your hands over your eyes.

2.
Try to look at something on your table, like a crayon.



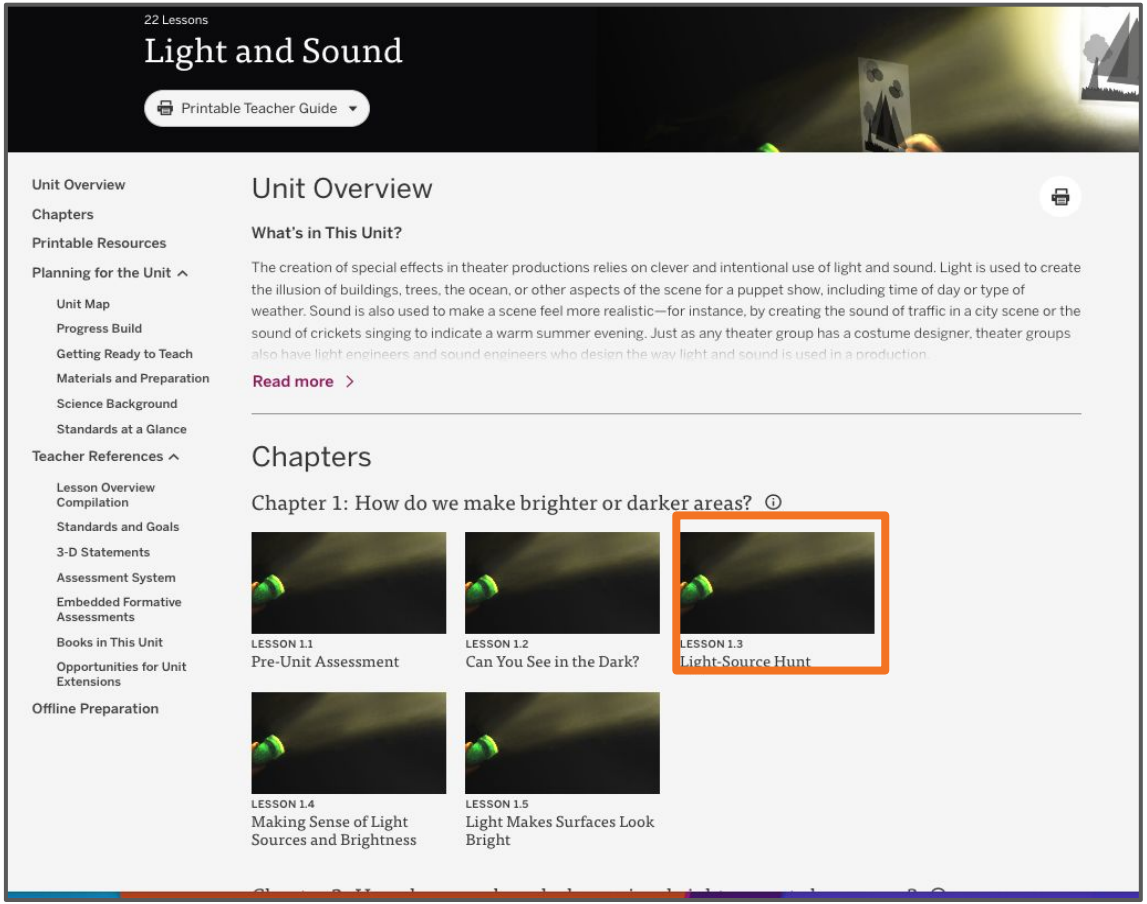
We will read this book together and think about **what we wonder**.

We will **ask questions** and look in the book for **evidence** that helps us answer our questions.

Light and Sound

Lesson 1.3

- Conducting a Light-source hunt
- Debriefing a Light-source Hunt
- Looking at pictures of Light Sources **(Assessment, Modeling Light Sources)**



Light-Source Hunt

1.
I'll lead you around the school. We'll stop in different places to **make observations of light sources.**

2.
You'll **record your observations** in your notebook.

3.
We will also **look for bright surfaces.**

Name: _____ Date: _____

Our Light Source Hunt

Directions:

1. In each box, draw a light source you observe.
2. On the line below each box, label the light source.

4

Light and Sound—Lesson 1.3

Take turns **sharing** the light sources you observed and how your drawings help you remember.

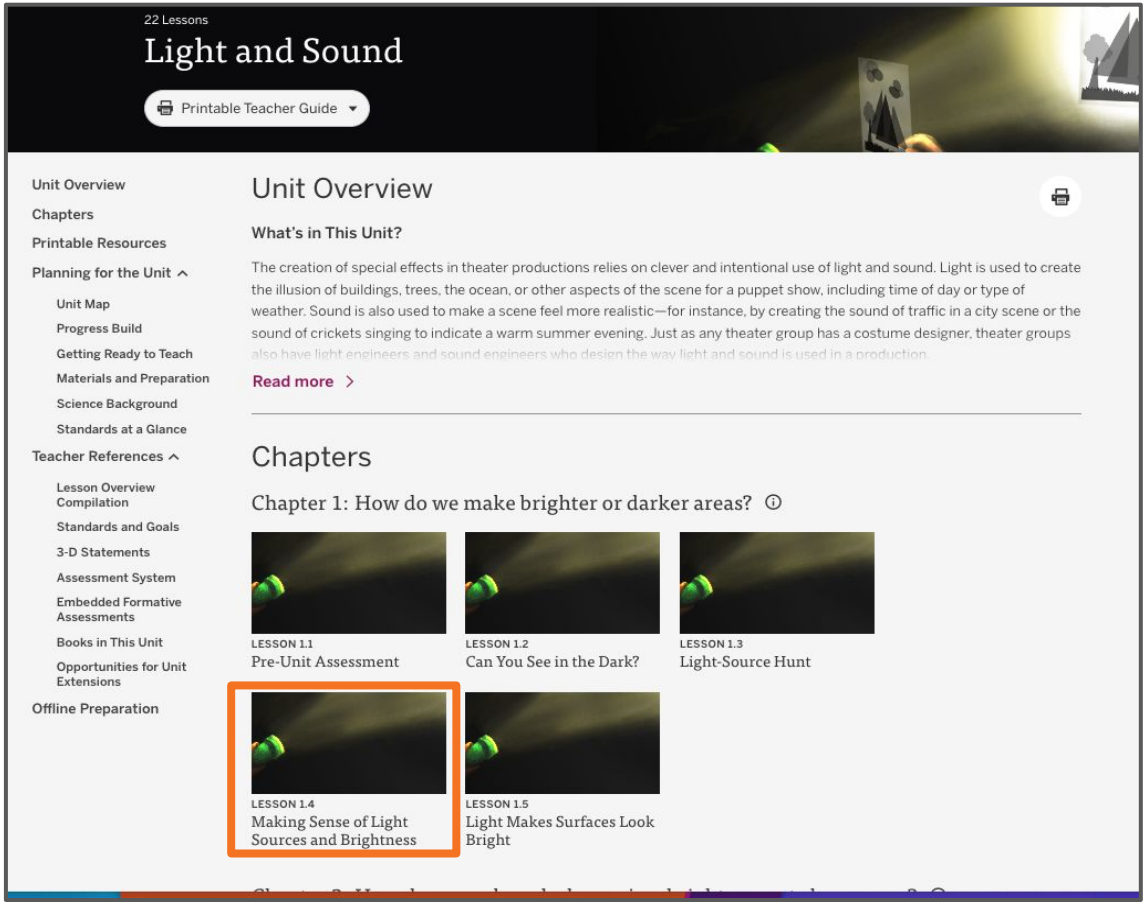
Now, I will show you some **pictures of light sources**.

For each picture, we'll discuss **what** we can see, **why** we can see it, and **where** the light is coming from that lets us see it.

Light and Sound

Lesson 1.4

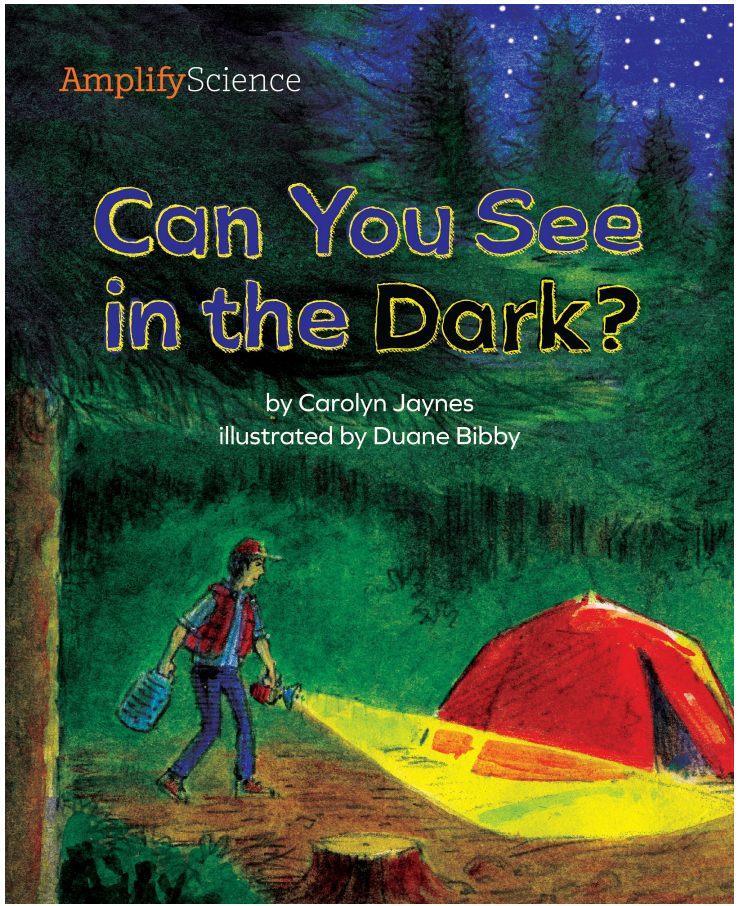
- Writing about Light-source observations
- Re-read *Can you See in the Dark?*
- Introducing cause and effect **(Assessment, Cause and Effect Table)**



Light Sources

Engineers write **notes** to help **remember** new ideas. Notes can help them make a solution to a problem later on.

Today, we will write notes about a **light source**.



We found many **light sources** at school. There are many other light sources in this book.

Today, you'll work with a **partner** to **find light sources** in this book.

There is a pattern. Something happens with light, so a surface looks bright.

This is something scientists and engineers think about—**cause and effect**.

It means that one thing makes something else happen.

Cause	Effect
I kicked the ball.	It rolled across the playground.
I bit the apple.	My loose tooth came out.

We can use this chart to list more examples of cause and effect.

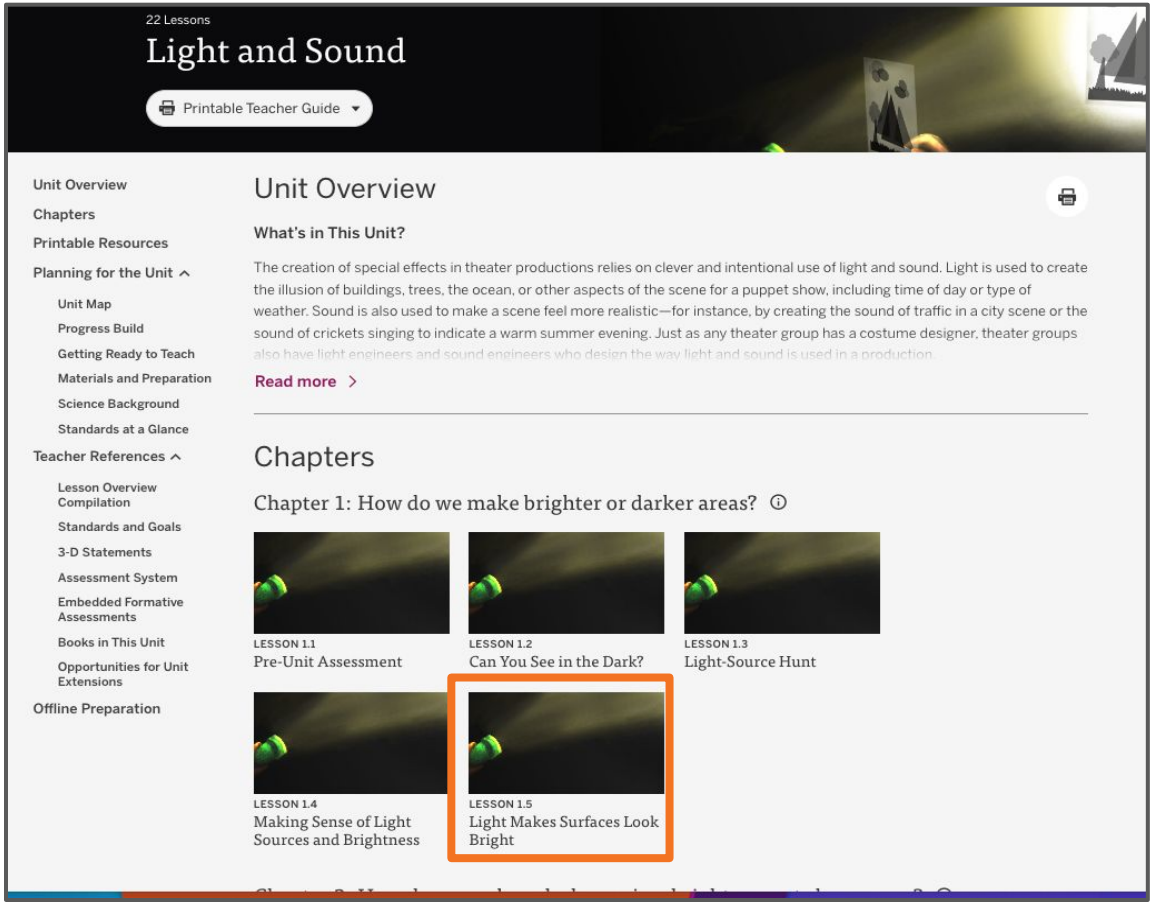
What are some everyday examples of **cause and effect** like the ones we talked about?

Light and Sound

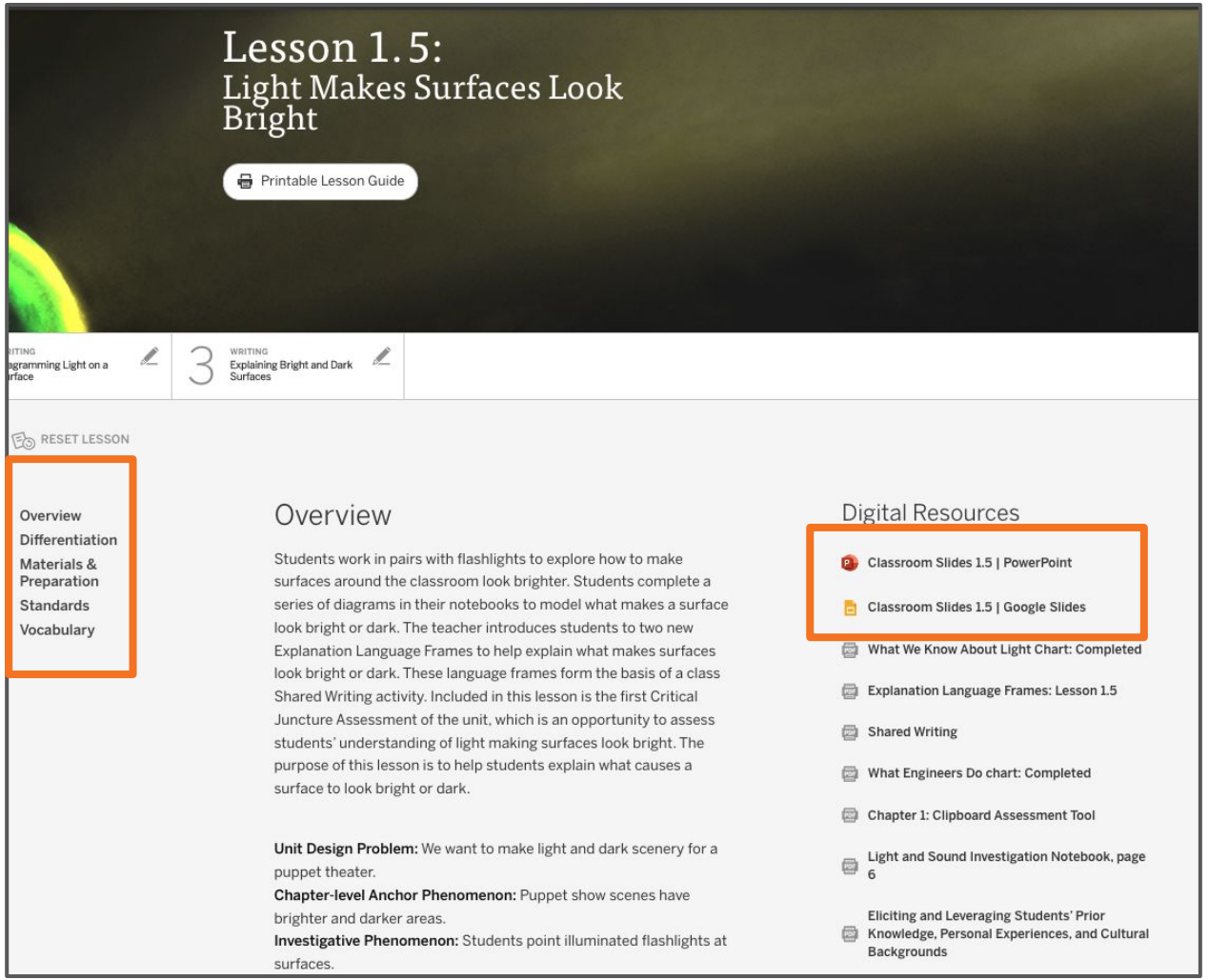
Model Lesson
Lesson 1.5

- **Investigate how to make surfaces look bright**

- Diagram light making a surface bright



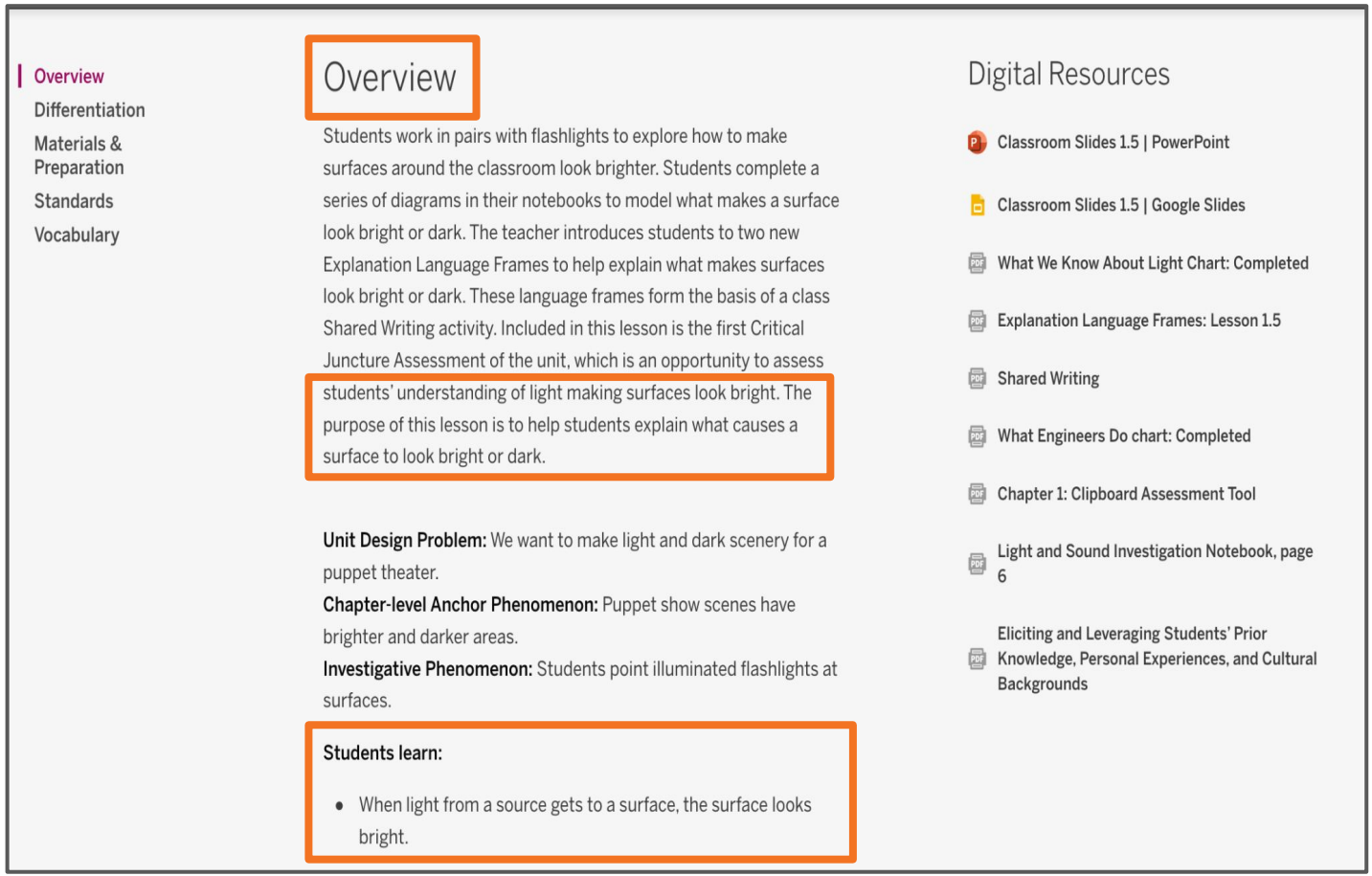
The Lesson Brief and Classroom Slides



Overview

Purpose

Learning Objectives



Overview
Differentiation
Materials & Preparation
Standards
Vocabulary

Overview

Students work in pairs with flashlights to explore how to make surfaces around the classroom look brighter. Students complete a series of diagrams in their notebooks to model what makes a surface look bright or dark. The teacher introduces students to two new Explanation Language Frames to help explain what makes surfaces look bright or dark. These language frames form the basis of a class Shared Writing activity. Included in this lesson is the first Critical Juncture Assessment of the unit, which is an opportunity to assess students' understanding of light making surfaces look bright. The purpose of this lesson is to help students explain what causes a surface to look bright or dark.

Unit Design Problem: We want to make light and dark scenery for a puppet theater.
Chapter-level Anchor Phenomenon: Puppet show scenes have brighter and darker areas.
Investigative Phenomenon: Students point illuminated flashlights at surfaces.

Students learn:

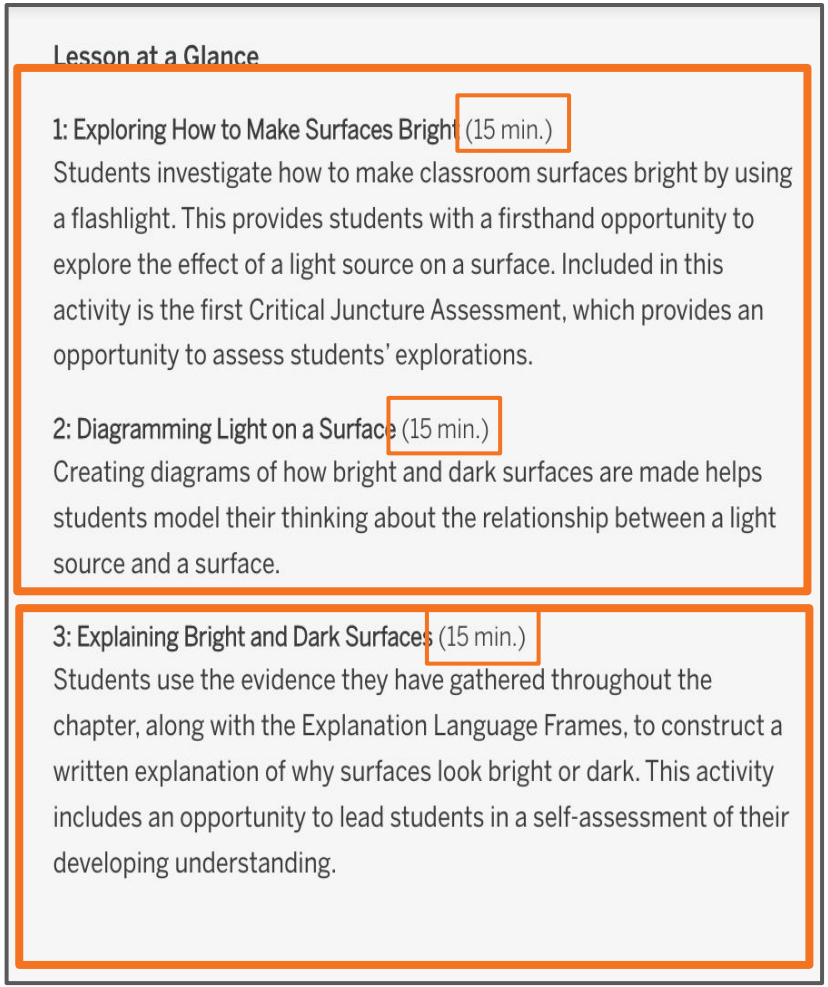
- When light from a source gets to a surface, the surface looks bright.

Digital Resources

- Classroom Slides 1.5 | PowerPoint
- Classroom Slides 1.5 | Google Slides
- What We Know About Light Chart: Completed
- Explanation Language Frames: Lesson 1.5
- Shared Writing
- What Engineers Do chart: Completed
- Chapter 1: Clipboard Assessment Tool
- Light and Sound Investigation Notebook, page 6
- Eliciting and Leveraging Students' Prior Knowledge, Personal Experiences, and Cultural Backgrounds

Overview

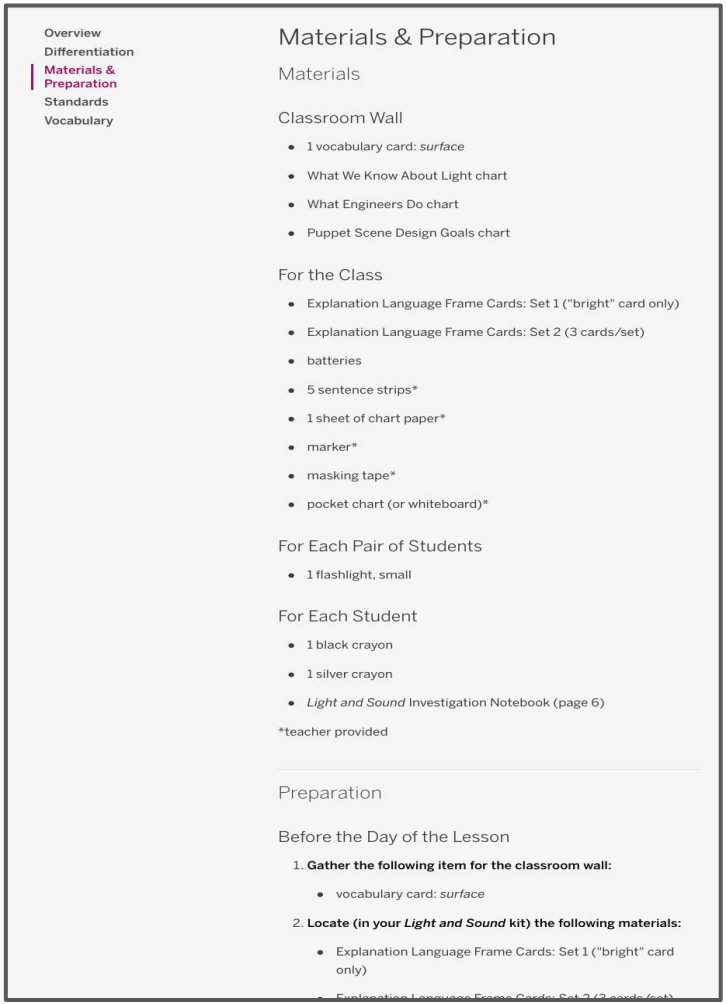
Timing and Pacing



Day 1

Day 2

Materials and Preparation



Overview
Differentiation
Materials & Preparation
Standards
Vocabulary

Materials & Preparation

Materials

Classroom Wall

- 1 vocabulary card: *surface*
- What We Know About Light chart
- What Engineers Do chart
- Puppet Scene Design Goals chart

For the Class

- Explanation Language Frame Cards: Set 1 ("bright" card only)
- Explanation Language Frame Cards: Set 2 (3 cards/set)
- batteries
- 5 sentence strips*
- 1 sheet of chart paper*
- marker*
- masking tape*
- pocket chart (or whiteboard)*

For Each Pair of Students

- 1 flashlight, small

For Each Student

- 1 black crayon
- 1 silver crayon
- *Light and Sound* Investigation Notebook (page 6)

*teacher provided

Preparation

Before the Day of the Lesson

1. **Gather the following item for the classroom wall:**
   - vocabulary card: *surface*
2. **Locate (in your *Light and Sound* kit) the following materials:**
   - Explanation Language Frame Cards: Set 1 ("bright" card only)
   - Explanation Language Frame Cards: Set 2 (3 cards/set)

Light and Sound

Classroom Wall

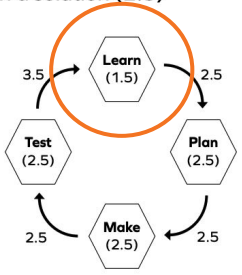
- 1 vocabulary card: *surface*
- What We Know About Light chart
- What Engineers Do chart
- Puppet Scene Design Goals chart

For the Class

What Engineers Do (1.2)

Find out about a problem. (1.2)

Design a solution (2.5)



Share to communicate and explain your ideas. (1.5)

teacher provided

4. **Prepare Explanation Language Frames.** Using one or two sentence strips for each language frame, write:

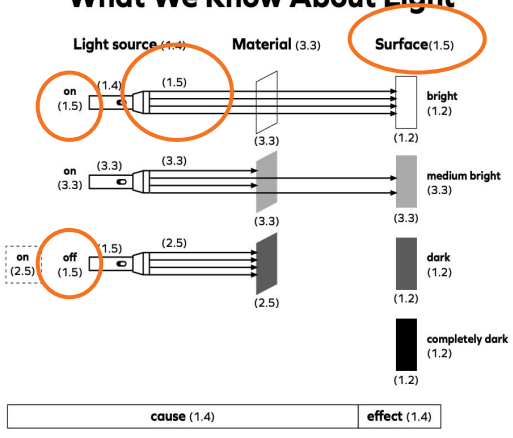
- "Light from the
- "Light from the
  ___."

5. Arrange the Explanation Language Frames and cards in a
lanation Language
es) to see what
ill look like.
t chart or attach
ape. Turn over the
ed to students
e *wall* surface card
ght card from
write "Whe
oks bright.
ts in this
Refer to the completed charts you printed out previously. (If you didn't print them out, you can find the PDF files in Digital Resources.)

- **What Engineers Do.** You will add to the chart in Activity 3 of this lesson.
- **What We Know About Light.** You will add to this chart with students in Activity 2.

When light from a source gets to a surface, the surface looks bright.

What We Know About Light



Digital Resources

Point
e Slides

- What We Know About Light Chart: Completed
- Explanation Language Frames: Lesson 1.5
- Shared Writing
- What Engineers Do chart: Completed
- Chapter 1: Clipboard Assessment Tool
- Light and Sound Investigation Notebook, page 6

Eliciting and Leveraging Students' Prior

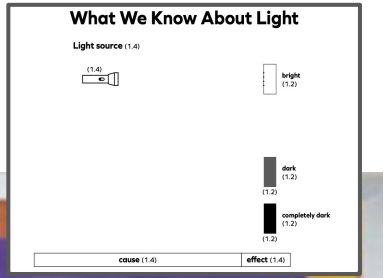
Investigation Question: What makes something look bright or dark?

Immediately Before the Lesson

1. **Write the Investigation Question on the board.** If the Investigation Question from Lesson 1.2 was erased, rewrite "What makes something look bright or dark?" You will revise this question in Activity 1.

Light and Sound

Classroom Wall (*before Lesson 1.5*)



Unit Question

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

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

Investigation Question: *"What makes something look bright or dark?*

Investigation Question: *"Where does the light come from that makes surfaces look bright or dark?*

Key Concepts

"Light makes things look bright."

"You need some light to see.:

"All light comes from a source."

Vocabulary

engineer

source

observe

Differentiation

Specific Differentiation Strategies for English Learners

Bilingual Spanish glossary. Having access to translations and definitions of new science terms in Spanish is helpful for English learners for whom Spanish is their primary language. In this lesson, the key vocabulary word *surface* is introduced. Have students turn to pages 28–29, Glossary, in the *Light and Sound* Investigation Notebook to see the Spanish translation and definition for *surface* and point out that *surface* sounds similar to the Spanish *superficie*. Encourage students to refer to this glossary as needed throughout the unit.

Vocabulary scaffold. You may wish to provide additional practice for English learners to use the word *surface* in context after introducing the word through the vocabulary routine. If students are reluctant to say the word, you might invite them to point to different surfaces. Ensuring that students understand what a surface is will help them be successful during the diagramming and Shared Writing activities.

Promoting inclusion in discussions. Participating in discussions is critical for English learners to develop science knowledge and the language of science. Some English learners may be hesitant to contribute to whole-class or small-group discussions because they lack experience or confidence in participating in small or large group discussions. However, they have a lot to say. There are several steps you can take to support English learners to fully engage in

Grade 1 | Light and Sound

Lesson 1.5: Light Makes Surfaces Look Bright

AmplifyScience

Activity 1

Exploring How to Make Surfaces Bright

Investigation Question:

What makes something look bright or dark?

We have some of the ideas we need to make **scenes** for the puppet-theater company.

We still need to figure out how they can project the scene onto any wall they choose.

We need to figure out how to make a **specific surface look bright.**

Vocabulary

surface

the outside part of something

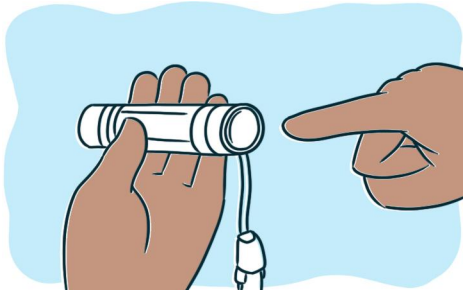
Investigation Question:

What makes a surface look bright or dark?

We will use these light sources to explore making surfaces look brighter.

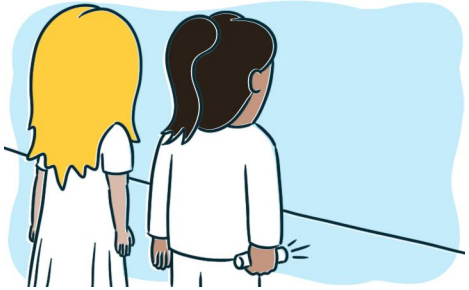
What are some **surfaces** around the classroom?

Making Surfaces Bright



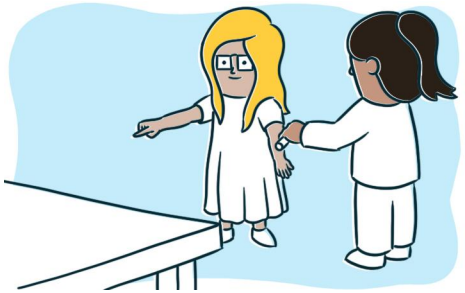
1.

Turn the flashlight on. Press the button.



2.

Choose **one surface** at a time, and **make it bright.**



3.

Take turns. Pick a different surface each time.

Only Point Your Flashlight at Surfaces. Do Not Point Them At Each Other. The Flashlight Is Not a Toy.

What did you do to make surfaces **look brighter?** Why did it work?

15 MIN

Activity 2

Diagramming Light on a Surface

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.

Light source Surface

Light source Surface

We will work on these two diagrams on page 6 in our notebooks.

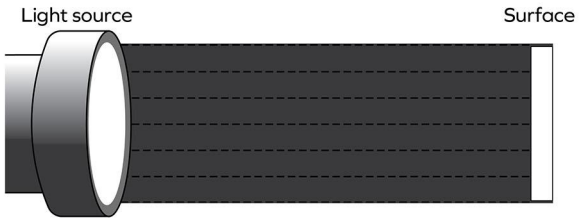
Scientists and engineers make **diagrams** to show their ideas. A diagram is an illustration that shows how something works.

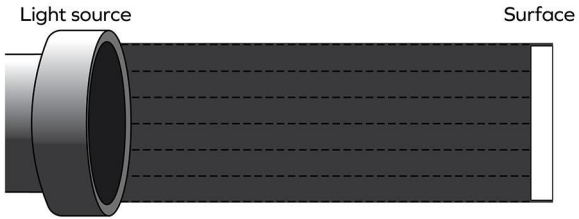
Name: _____ Date: _____

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.





We can use the top diagram to show what makes a **surface** look **bright.**

I will show you how. Let's start by thinking about the surface.

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.

Light source Surface

Light source Surface

Leaving the surface **white** shows it is **bright.** The flashlight is white, which shows it is **on.**

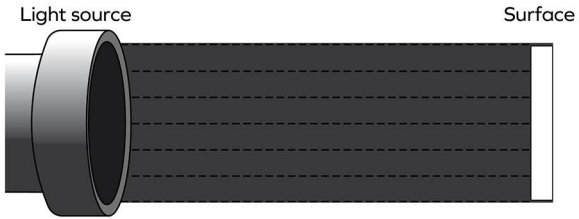
Let’s think about how to show what makes the surface bright.

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.



Real light doesn't look like arrows, but we can use arrows to show light.

Does this **arrow** show light starting at the source and getting all the way to the surface?

Name: _____ Date: _____

Diagramming Light on a Surface

Directions:

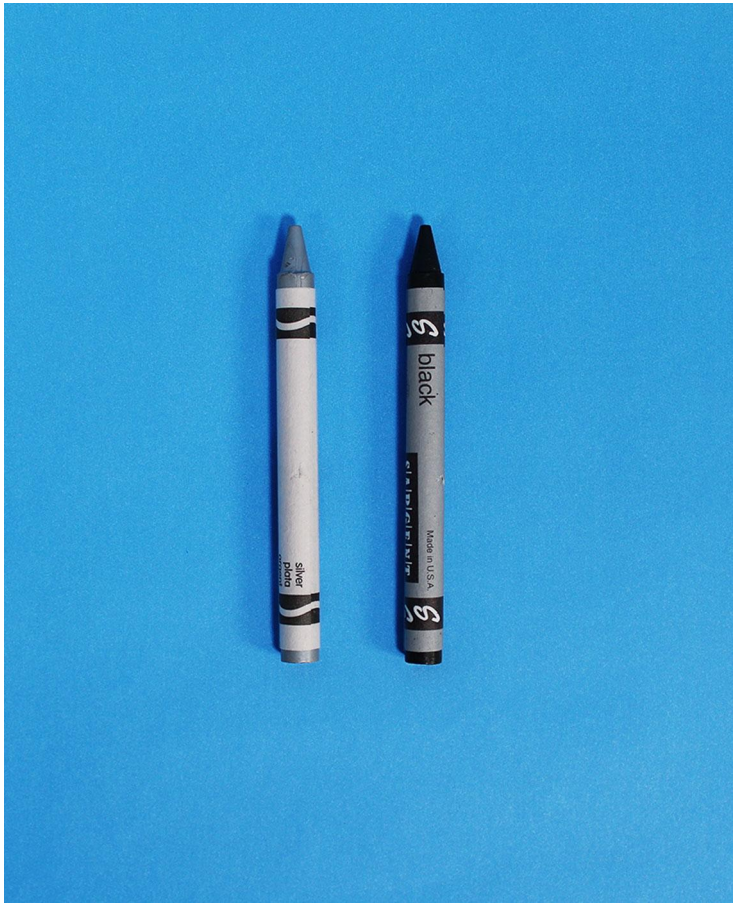
1. Complete the first diagram to show a bright surface.
2. Complete the second diagram to show a dark surface.

Light source Surface

Light source Surface

The light starts at the **source**, and the light goes all the way over to the **surface**.

Long arrows show what makes the surface look bright.



You will use a **silver and black crayon** to draw on this notebook page.

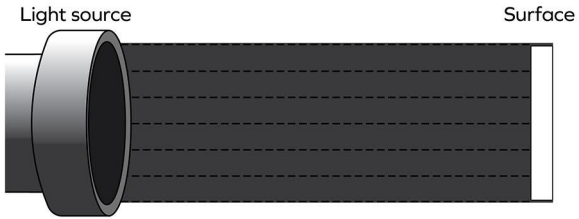
I will tell you when to use them.

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.



Turn to page 6 in your notebooks.

Use the silver crayon to **complete the top diagram**.

We didn’t just observe bright surfaces. We also observed dark surfaces.

How did we make a surface look **dark**?

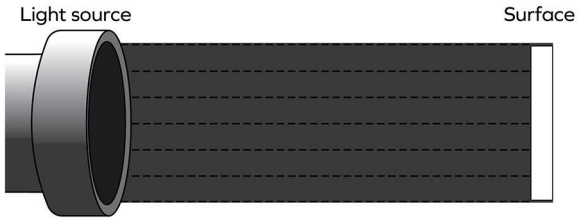
Just as we can make a surface look bright, we can also make a surface look dark.

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.



We can use the bottom diagram to show what makes a surface look **dark.**

I will show you how. Let's start by thinking about the surface.

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.

Light source Surface

Light source Surface

Coloring the surface black shows it is dark. The flashlight is dark, so it's off.

Should we create the diagram **with arrows** or **without arrows**?

Name: _____ Date: _____

Diagramming Light on a Surface

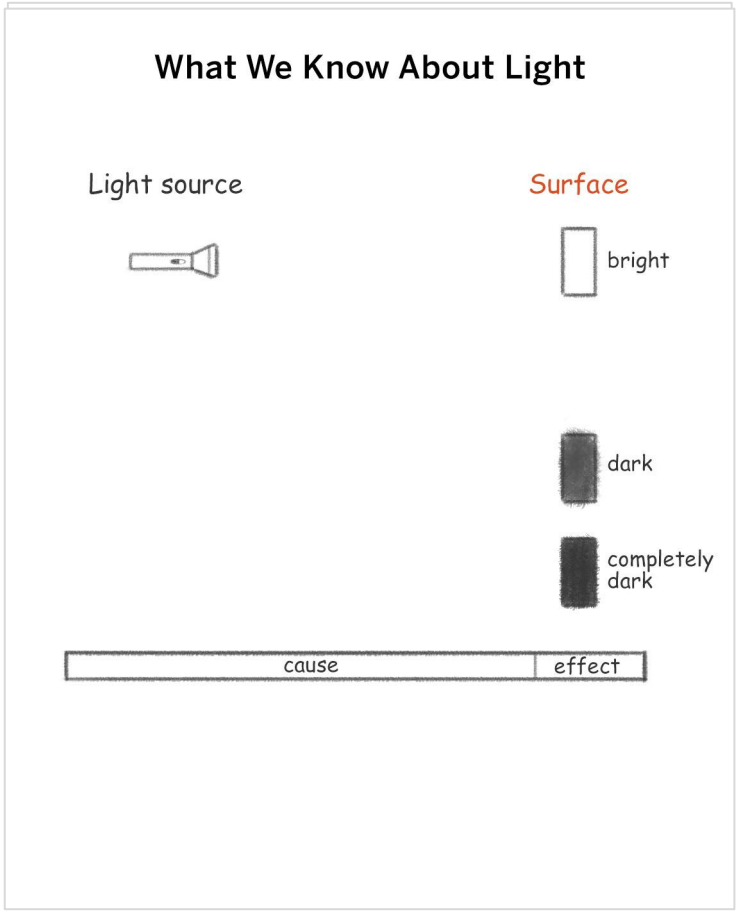
Directions:

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

Light source Surface

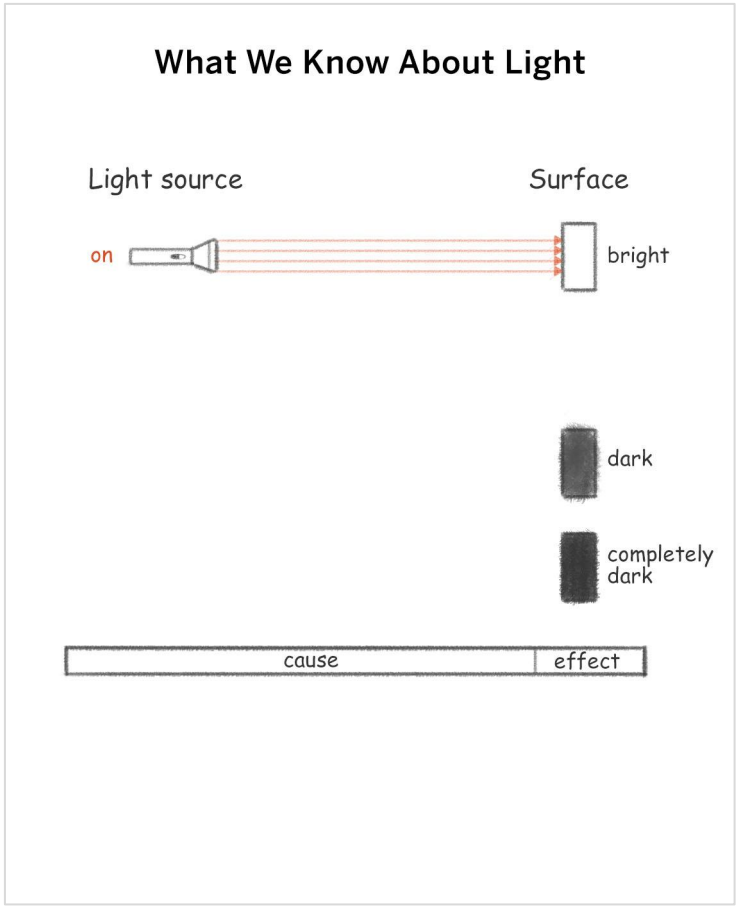
Light source Surface

Use the black crayon to **complete the bottom diagram.**

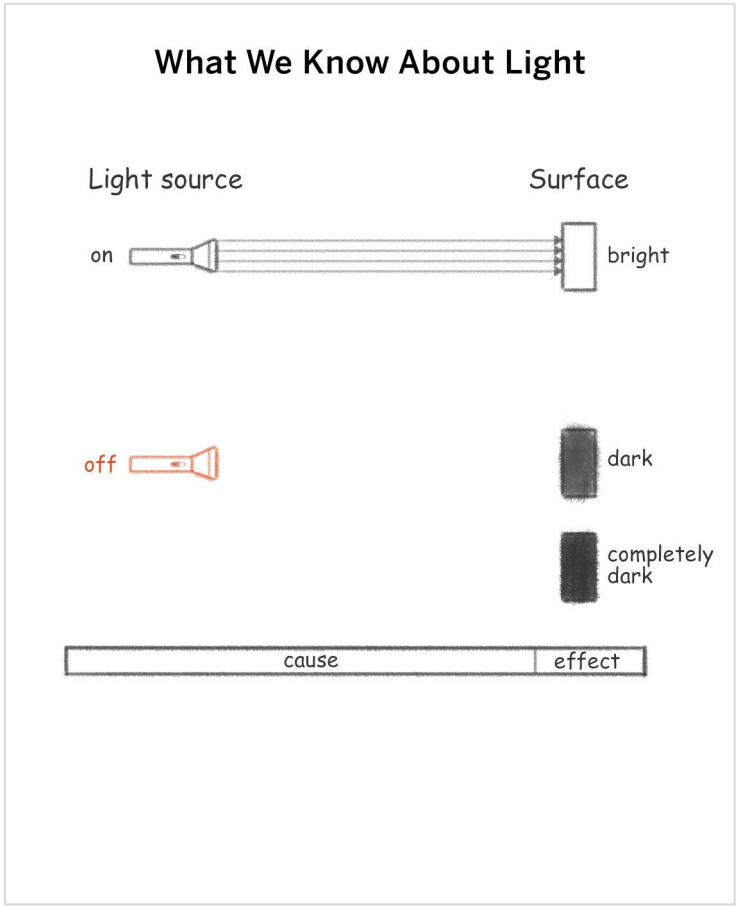


Let's **add to our chart** to show our new ideas.

We learned the **surface** is the outside part of something and that a surface can look **bright** or **dark**.



We learned that **light** from a light source has to **get to the surface** to make the surface look **bright**.

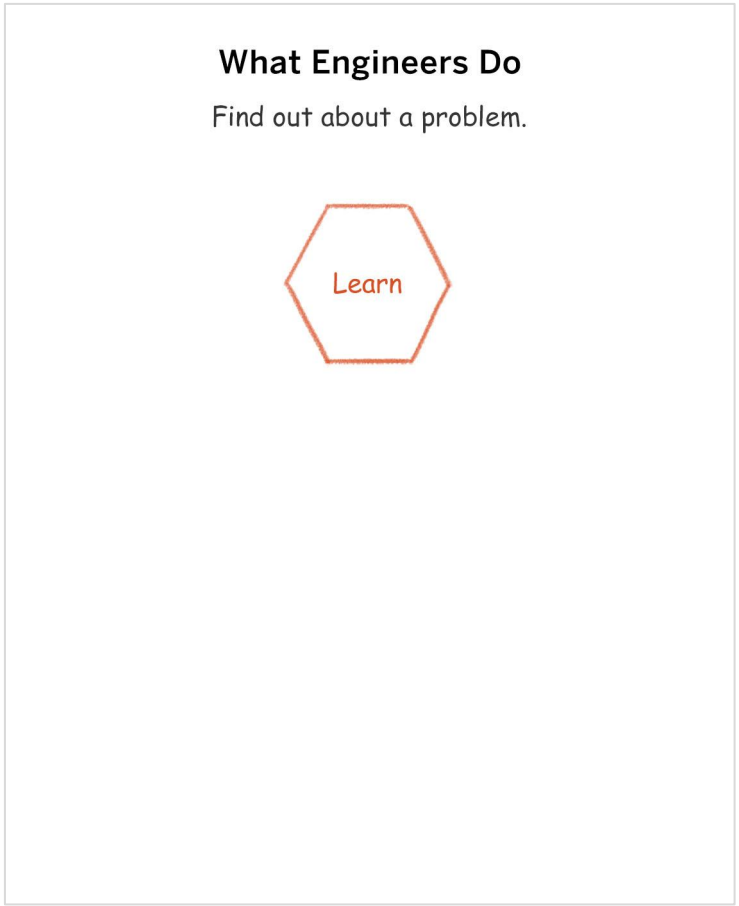


We know that if there is **not a light source** shining on a surface, the surface looks **dark**.

Now the chart shows the same ideas as the diagrams we made.

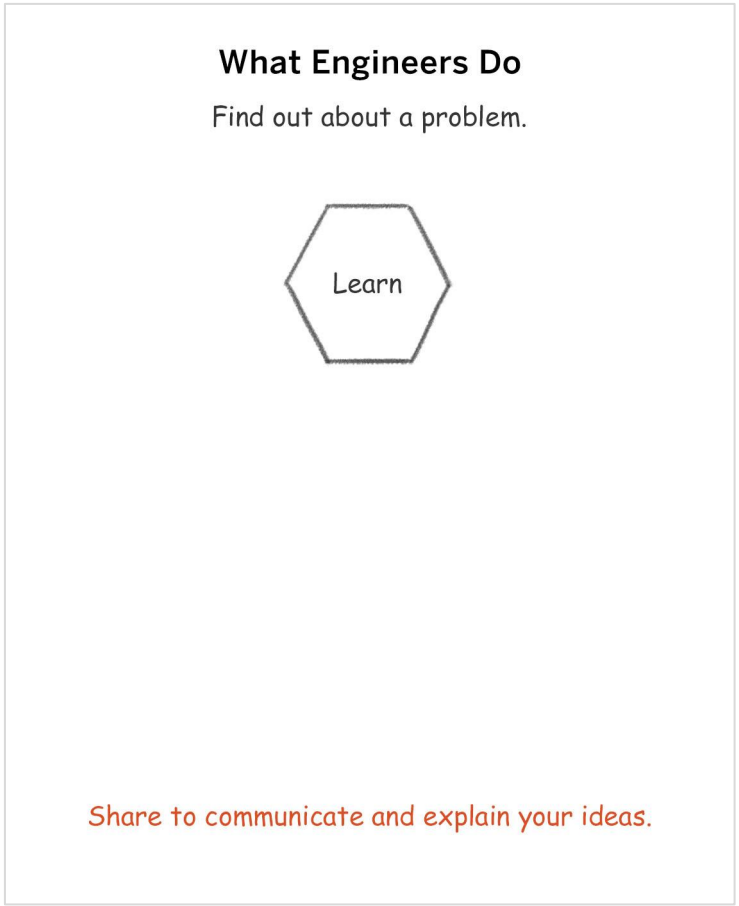
Activity 3

Explaining Bright and Dark Surfaces



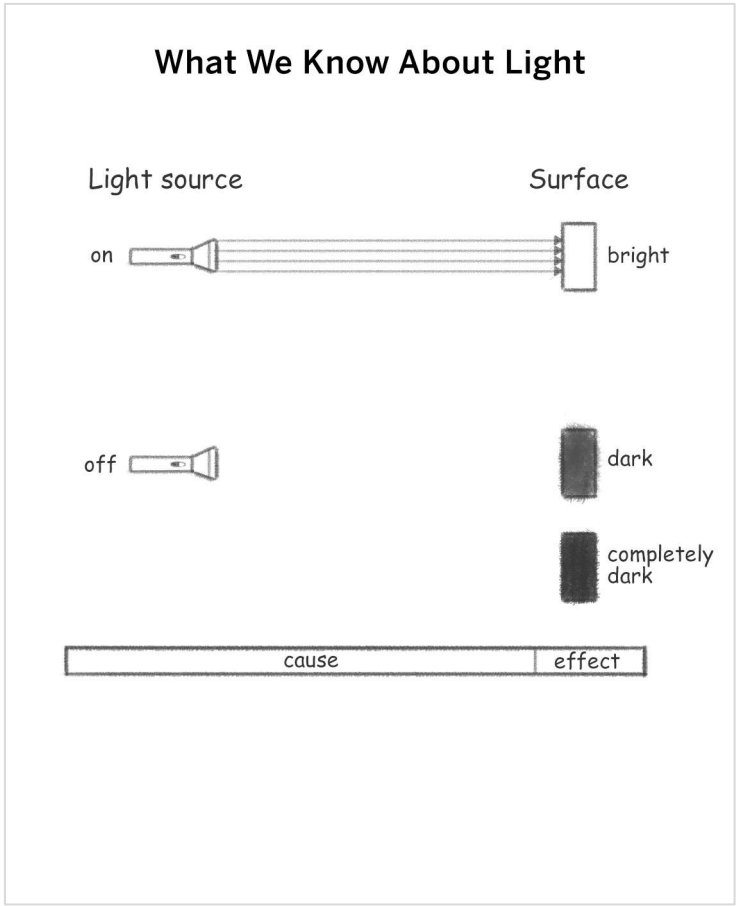
We have been working as light and sound engineers. We have **learned** a lot about light!

Let's add that idea to our What Engineers Do **chart**.



Engineers explain their observations and ideas by making **diagrams.**

They also talk and write about why things happen to explain and **communicate** their ideas.



We will work together to **write an explanation** about the diagrams we drew on the **What We Know About Light** chart.

Let’s start by explaining the **bright surface**.

We’ll use these words to **explain** why the surface in the diagram is bright.

Shared Writing

Why does the wall look bright?

Now, I will write our ideas on the chart.

Remember, we can **connect** what happens using the word **so.**

Now, let's explain the **dark surface**.

We can use these words to **explain** why the surface in the diagram looks dark.

Shared Writing

Why does the wall look bright?

Why does the wall look dark?

First, we explained why the wall looks **bright**.

Now, let's work together to explain why the wall looks **dark** when the **flashlight is off**.

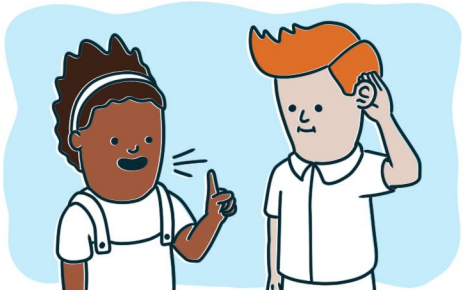
We have been using the word **so** to show how two things—a **cause** and an **effect**—are **connected**. The cause is what makes the other thing happen, and the effect is what happens.

Let’s think about **cause and effect** in the **explanations** we wrote.

We have **learned** many new things. We learned that when scientists learn something new, their **science knowledge changes**.

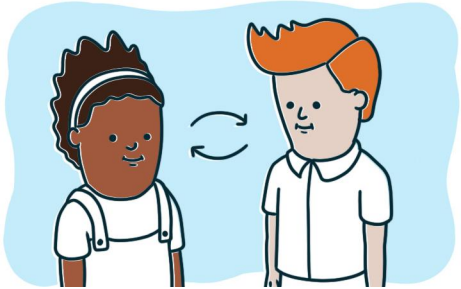
We have figured out **new ideas about light**—where it comes from and what it does.

Self-Assessment: Share a new idea you learned.



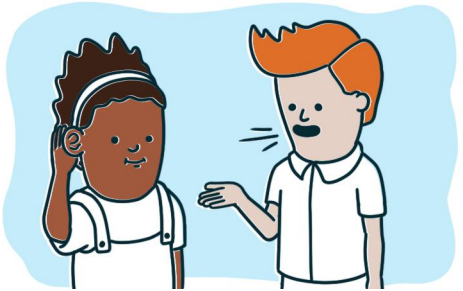
1.

Partner A shares.
Partner B listens.



2.

Partners switch.



3.

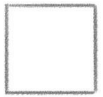
Partner B shares.
Partner A listens.

Key Concept

When light from a source gets to a surface, the surface looks bright.

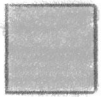
Puppet Scene Design Goals

- The scene should have a <u>bright</u> area.



- The scene should have a <u>dark</u> area.

- The scene should have a <u>medium bright</u> area, between bright and dark.



We have learned what we need to do in order to make a surface look bright.

What **questions** do we need to ask and try to answer next?

End of Lesson

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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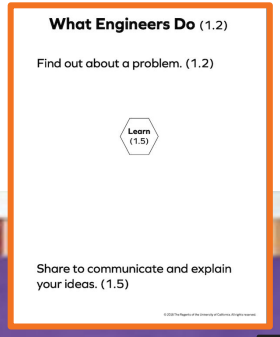
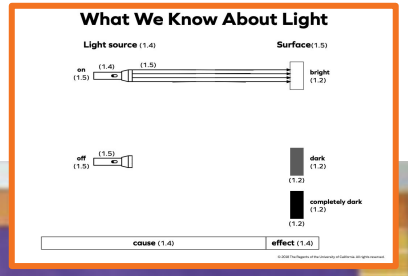
Light and Sound

Classroom Wall (*After Lesson 1.5*)





Unit Question

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

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

Investigation Question: *"What makes something look bright or dark?*

Investigation Question: *"Where does the light come from that makes surfaces look bright or dark?*

Investigation Question: *"What makes a surface look bright or dark?"*

Key Concepts

"Light makes things look bright."

"You need some light to see.:

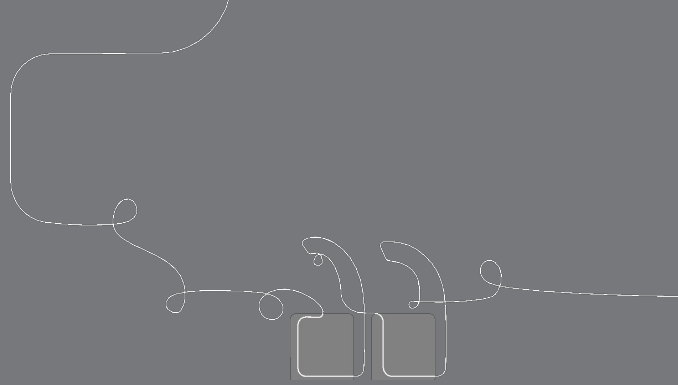
"All light comes from a source."

"When light from a source gets to a surface, the surface looks bright."

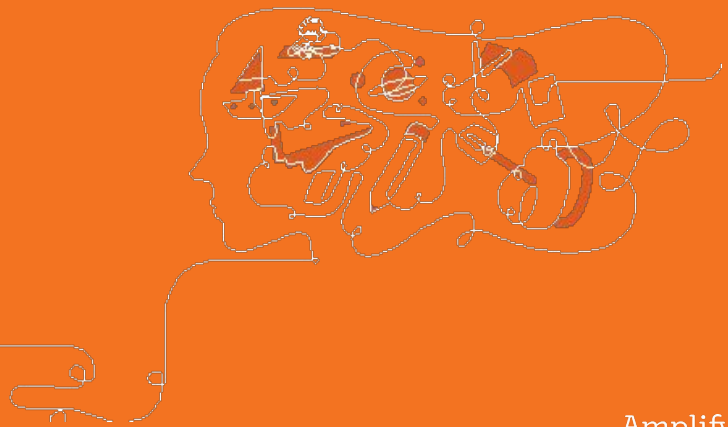
Vocabulary

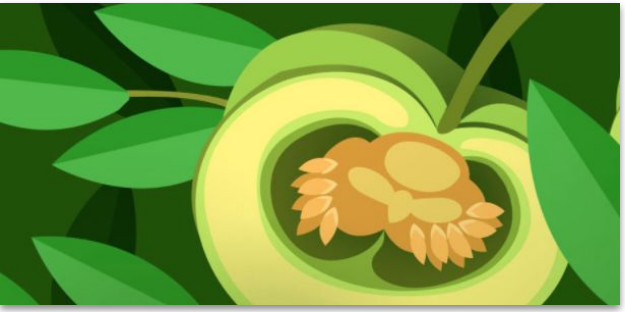
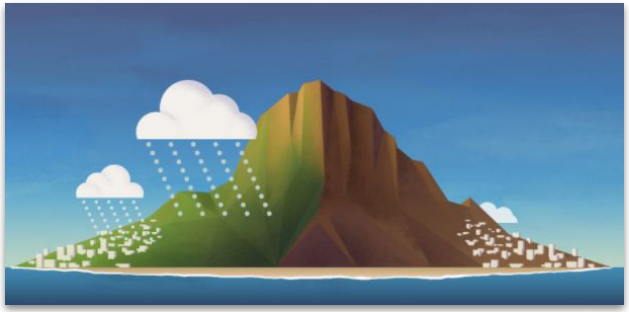
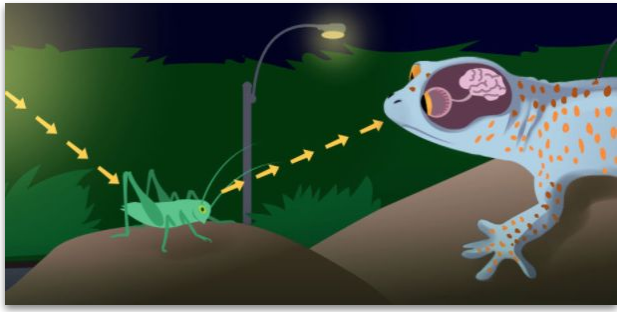
- engineer
- source
- observe
- surface

Questions?



Break



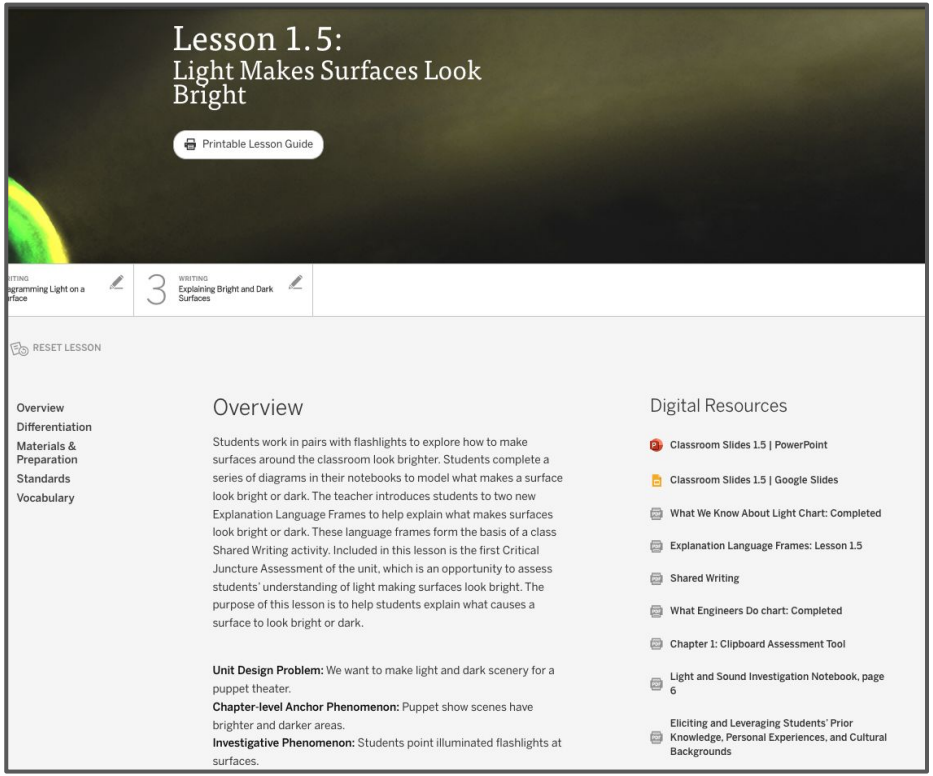
Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Work Time - Planning (Assessments)

- Navigate to a lesson that you'll be teaching in the upcoming week that has a formative assessment opportunity (you might want to refer to the **Embedded Formative Assessment or Assessment System** documents on the Unit Landing Page)

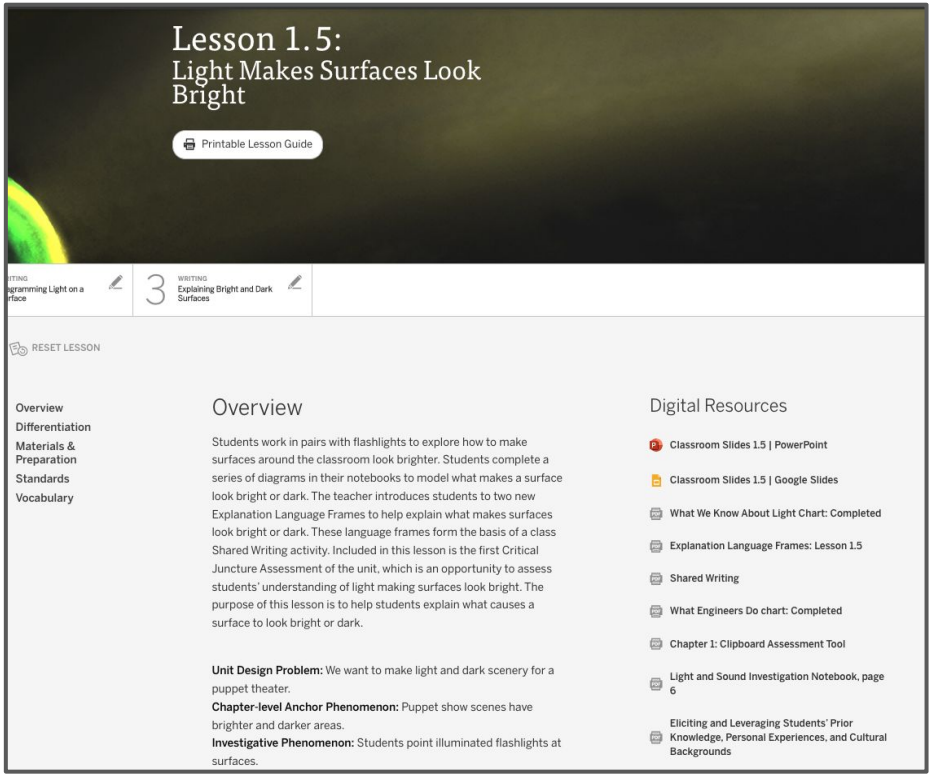
What do your assessment types look like? What preparations do they require?



Work Time - Planning (Assessments)

Pg. 16-17

- Download and review the classroom slides
- Read the unit overview
- Read the Materials and Prep
- Read the differentiation
- Prepare any data collectors or assessment materials needed.

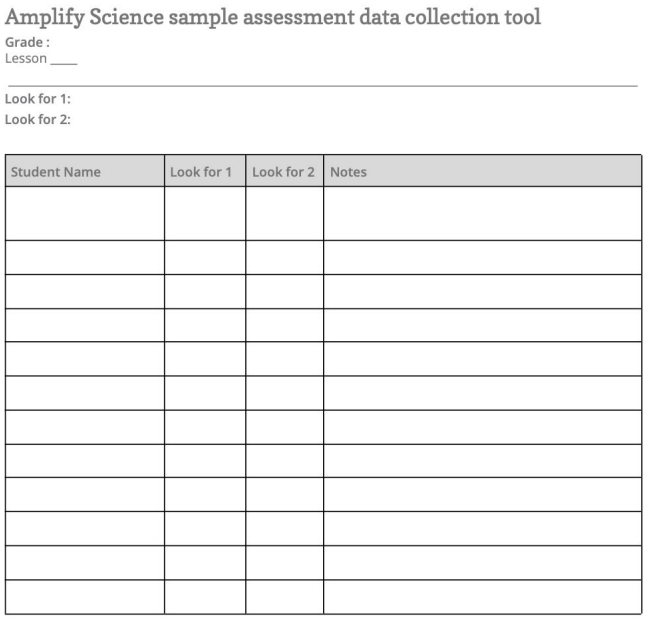


Work Time - Planning (Assessments)

Pg. 16-17

Be prepared to share out the:

- Lesson you're planning for and the type of assessment
- "Look Fors" or "Assess for Understanding"
- "Now What" or "Tailor Instruction"
- Personal observations, reflections, or practices that you plan to use



Amplify Science sample assessment data collection tool

Grade :
Lesson ____

Look for 1:
Look for 2:

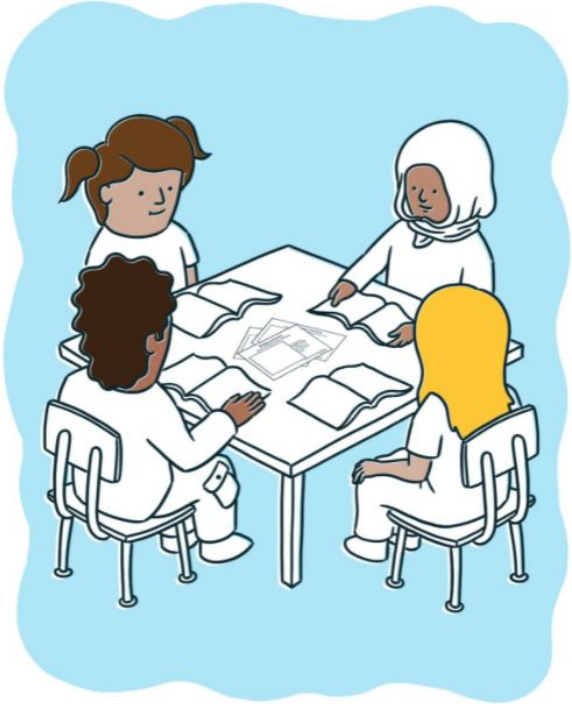
Student Name	Look for 1	Look for 2	Notes

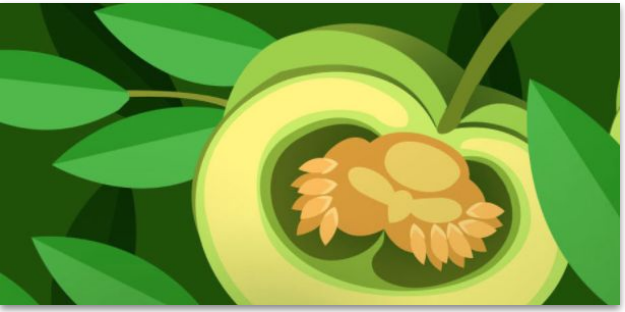
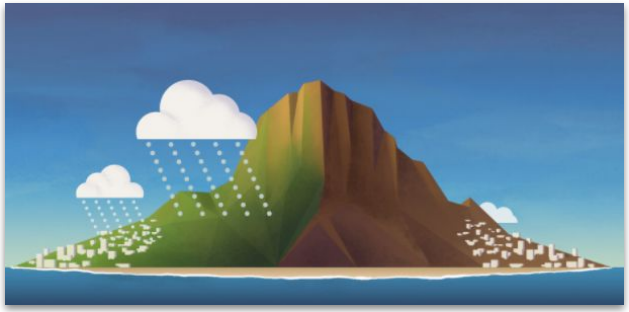
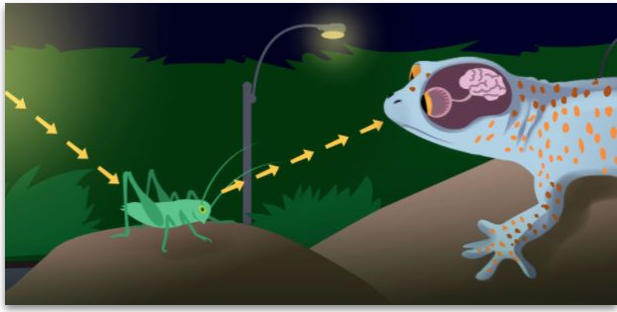
Share Out

Work Time - Planning (Assessments)

Be prepared to share out the:

- Lesson you're planning for and the type of assessment
- "Look Fors" or "Assess for Understanding"
- "Now What" or "Tailor Instruction"
- Personal observations, reflections, or practices that you plan to use



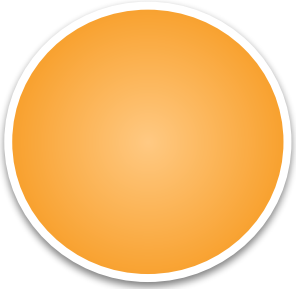
Plan for the day

- Introduction & Framing
- Assessment System
- Progress Build
- Assessments
- Model Lesson
- Planning
- Closing

Closing reflection

Based on our work today, share:

1-3 big points you're taking away from this session

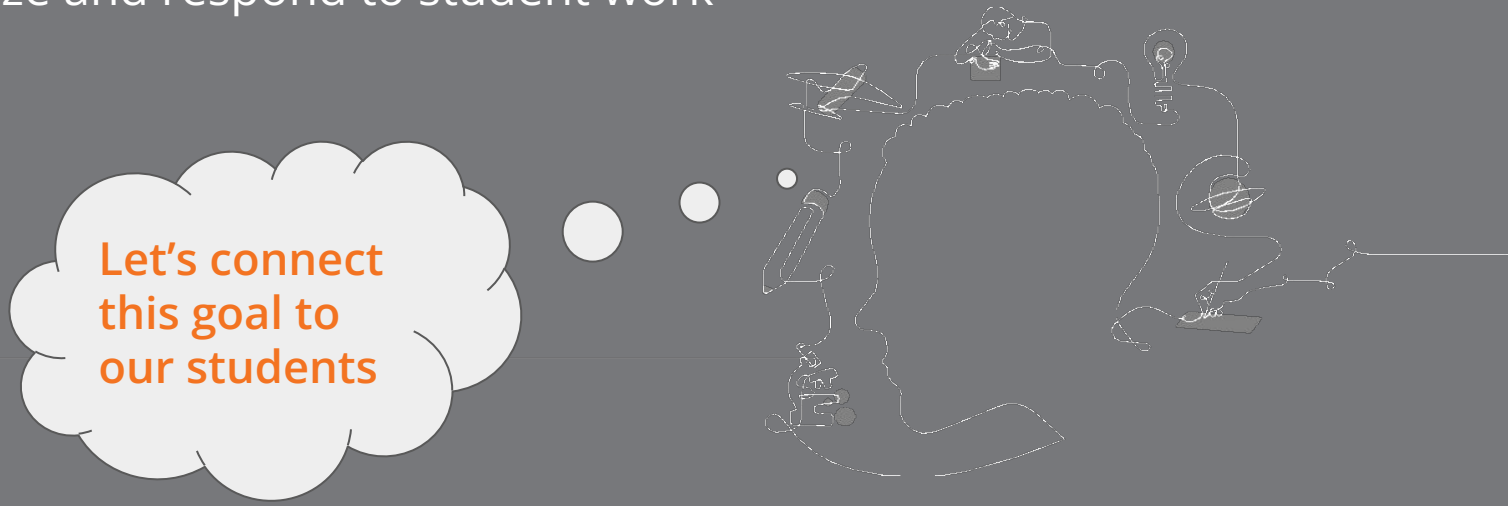


A question or topic that's still circling in your mind

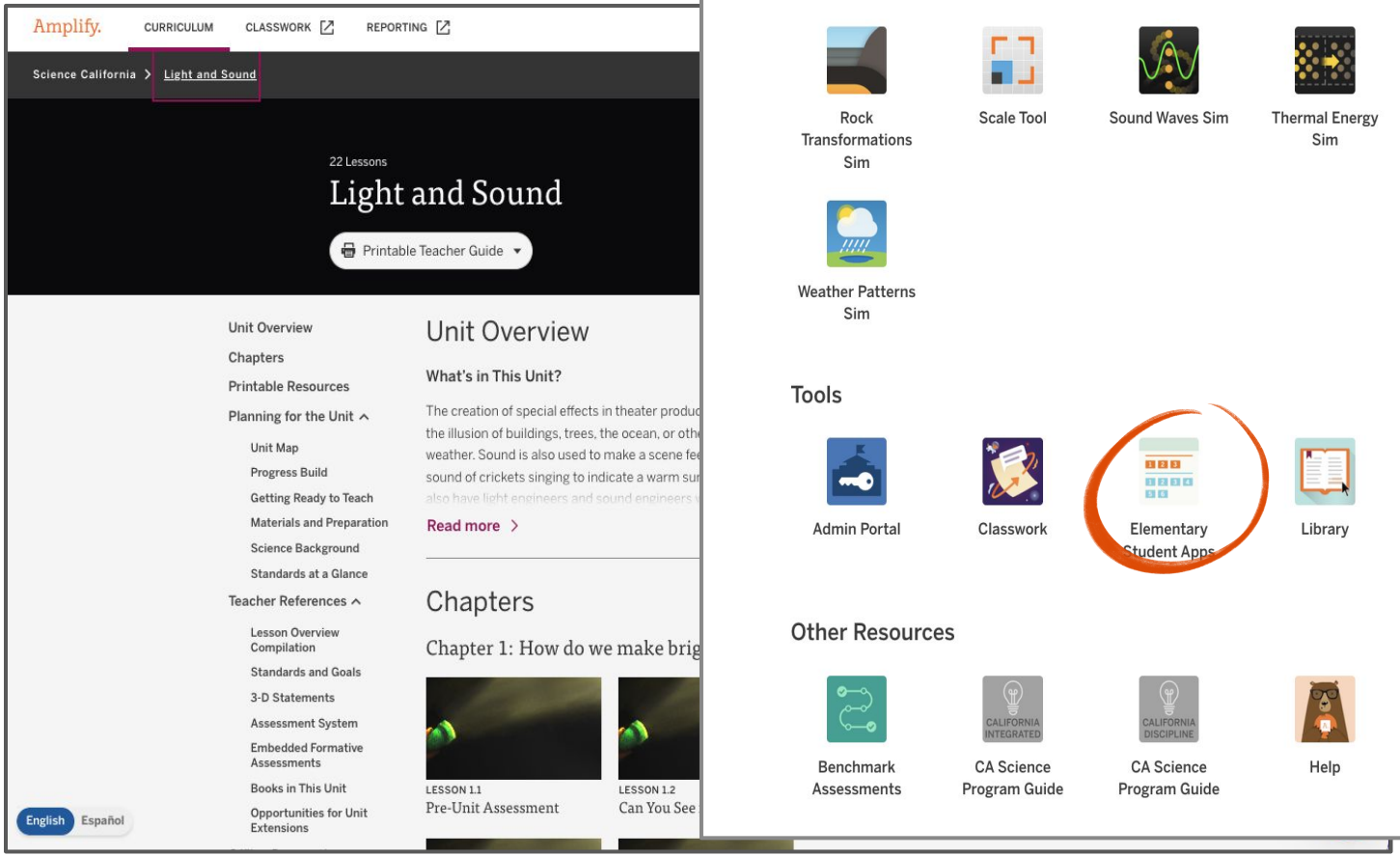
Something that's "squaring" (resonating) with you from this session

Overarching goals

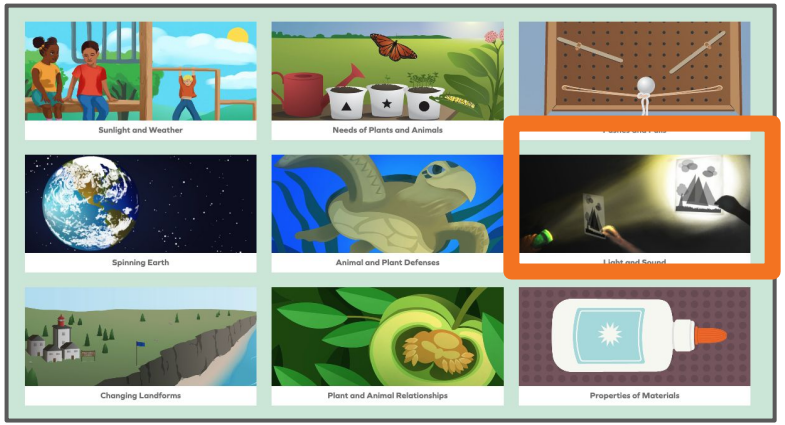
- ☑ Describe the structure and purpose of the Amplify Science Assessment System
- ☑ Plan for the strategic use of assessment resources to analyze and respond to student work

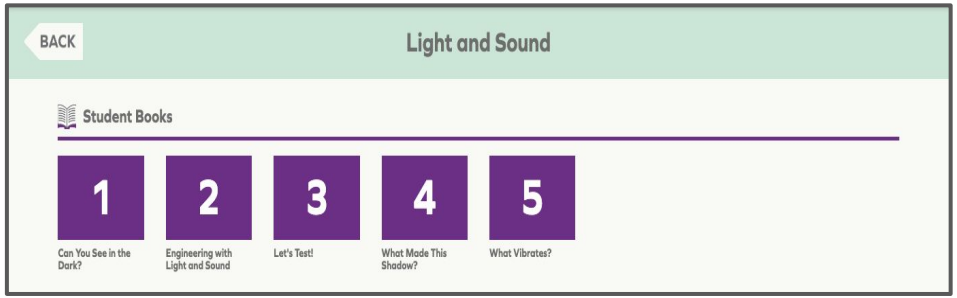


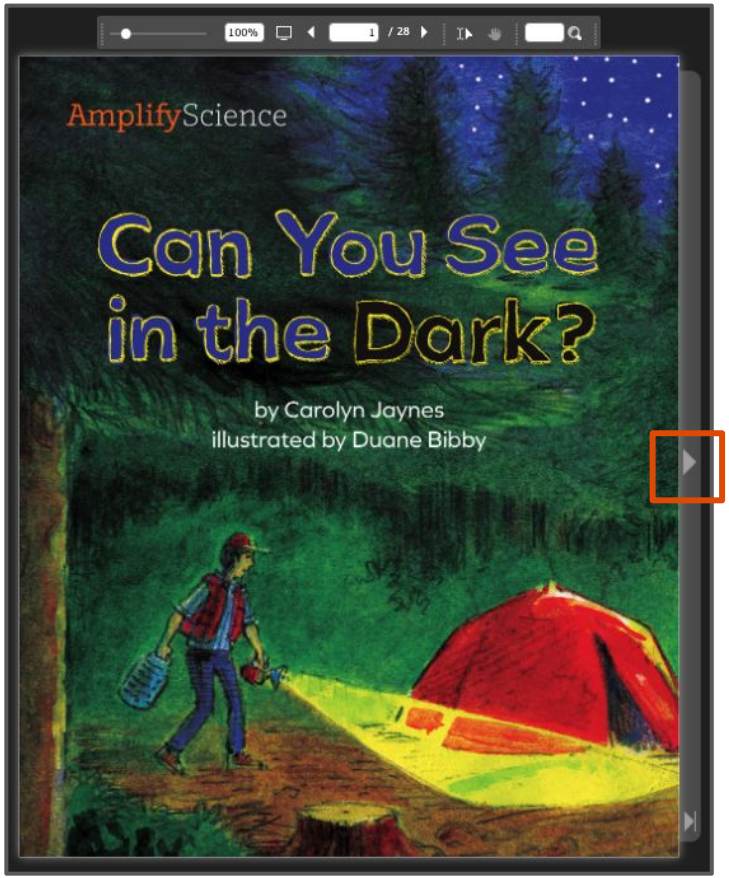
Navigating to the Student Apps page



Student Apps page and accessing the book

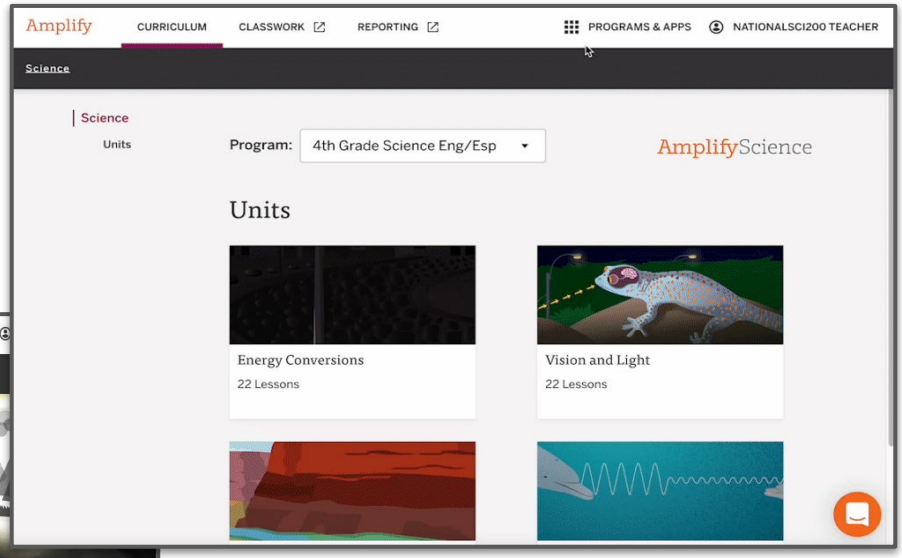


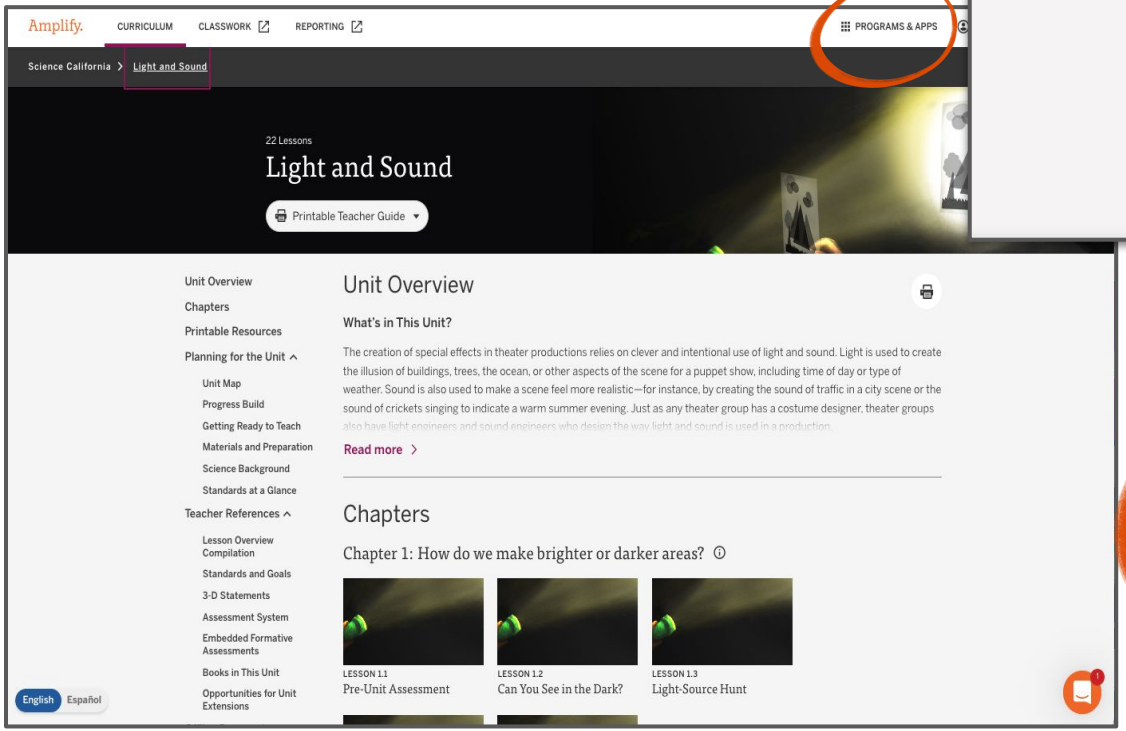


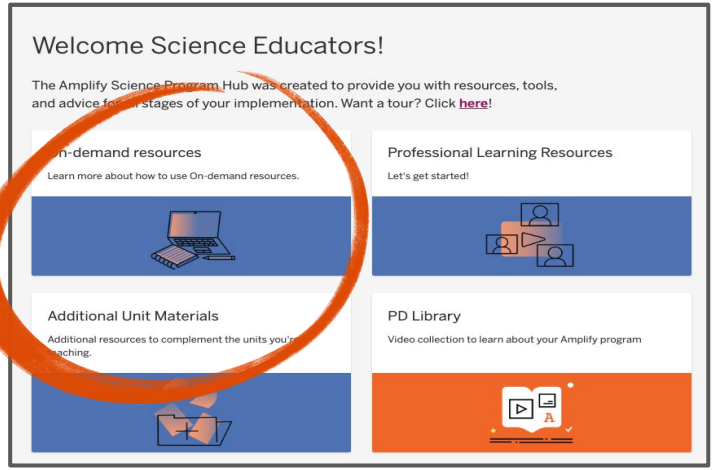


Program Hub

Use the Amplify Science Program Hub to find useful resources for implementing Amplify Science, including unit overview videos and planning tools.



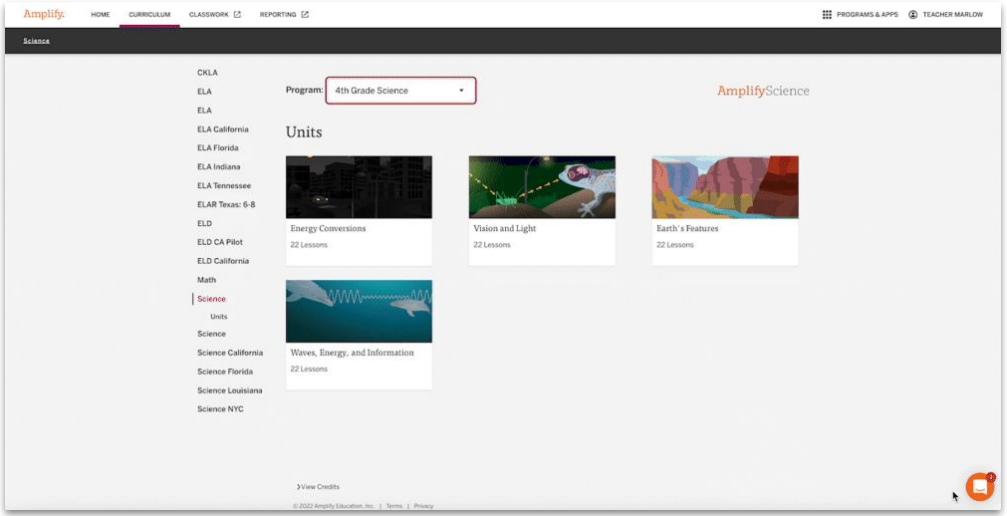




Additional resources and ongoing support

Seek information specific to enrollment and rosters, technical support, materials and kits, and teaching support.

Amplify Chat



K-2ND GRADE AMPLIFY SCIENCE PARTICIPANT FEEDBACK LINK

http://bitly.ws/xoMz